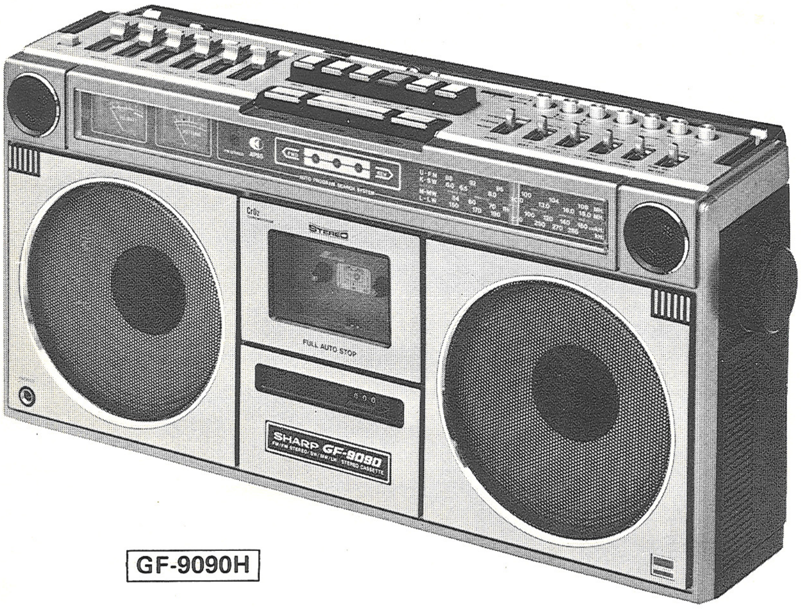
SHARP Service Manual

APSS
Auto Program Search System



GF-9090H

MODEL
GF-9090H (Silver Panel)
GF-9090HB (Black Panel)
GF-9090E

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

SPECIFICATIONS

GENERAL

Type:	Portable stereophonic cassette tape recorder with built-in LW/MW/SW/FM 4-band radio
Power source:	AC 110/220/240V, 50/60 Hz(H, HB) AC 240V, 50/60 Hz (E) DC 12V (Eight UM/SUM-1 batteries or External DC supply)
Power consumption:	24 watts
Speaker:	16cm (Woofer) x 2, Horn type (Tweeter) x 2
Power output:	MPO 8000 mW (DIN 45 324) (H, HB) MPO 11W (E): AC operation RMS power 7000 mW (3500 mW + 3500 mW : DC operation)
Semiconductors:	5-IC (Integrated Circuit), 47-transistor and 37-diode (4 Light Emitting Diode)
Dimensions:	485mm(W) x 115mm(D) x 240mm(H)
Weight:	5.8 kg (without batteries)
Input terminals:	1 EXT. MIC. 600 ohms (J201, J202) 2 Remote control (J302) 3 EXT. DC power, 12V (J701) 4 AC input power (SO701) 5 REC/PB DIN socket, 2.5 mV/10K ohms (SO202) 6 FM EXT. Antenna (SO1)
Output terminals:	1 EXT. speaker, 4 ~ 8-ohms (SO301, SO302) 2 PHONES : 4 ~ 8 ohms (J301) 3 REC/PB DIN socket, 1V/50K ohms (SO202)

TAPE RECORDER SECTION

Type:	4-track stereo cassette tape recorder
Tape:	Philips type compact cassette tape
Tape speed:	4.8 cm/sec.
Recording system:	AC bias
Erasing system:	DC erasing
Recording time:	60 minutes (with C-60 tape)
Fast forward or rewind time:	120 sec. (with C-60 tape)
Frequency response:	40 ~ 15,000 Hz (CrO_2 tape) 40 ~ 12,000 Hz (Normal tape)
Wow and flutter:	0.3% (DIN 45 511) (H, HB) 0.15% (WRMS) (E)
S/N ratio:	50 dB

RADIO SECTION

Frequency range:	LW	150 ~ 285 kHz
	MW	520 ~ 1,620 kHz
	SW	5.95 ~ 18 MHz
	FM	87.6 ~ 108 MHz
Intermediate frequency:	LW/MW/SW 455 kHz FM 10.7 MHz	
Circuit system:	4-band superheterodyne system	
Antenna:	LW/MW ferrite core bar antenna SW/FM telescopic antenna FM EXT. antenna	

SHARP CORPORATION OSAKA, JAPAN

NAMES OF PARTS (Refer to Figure 1)

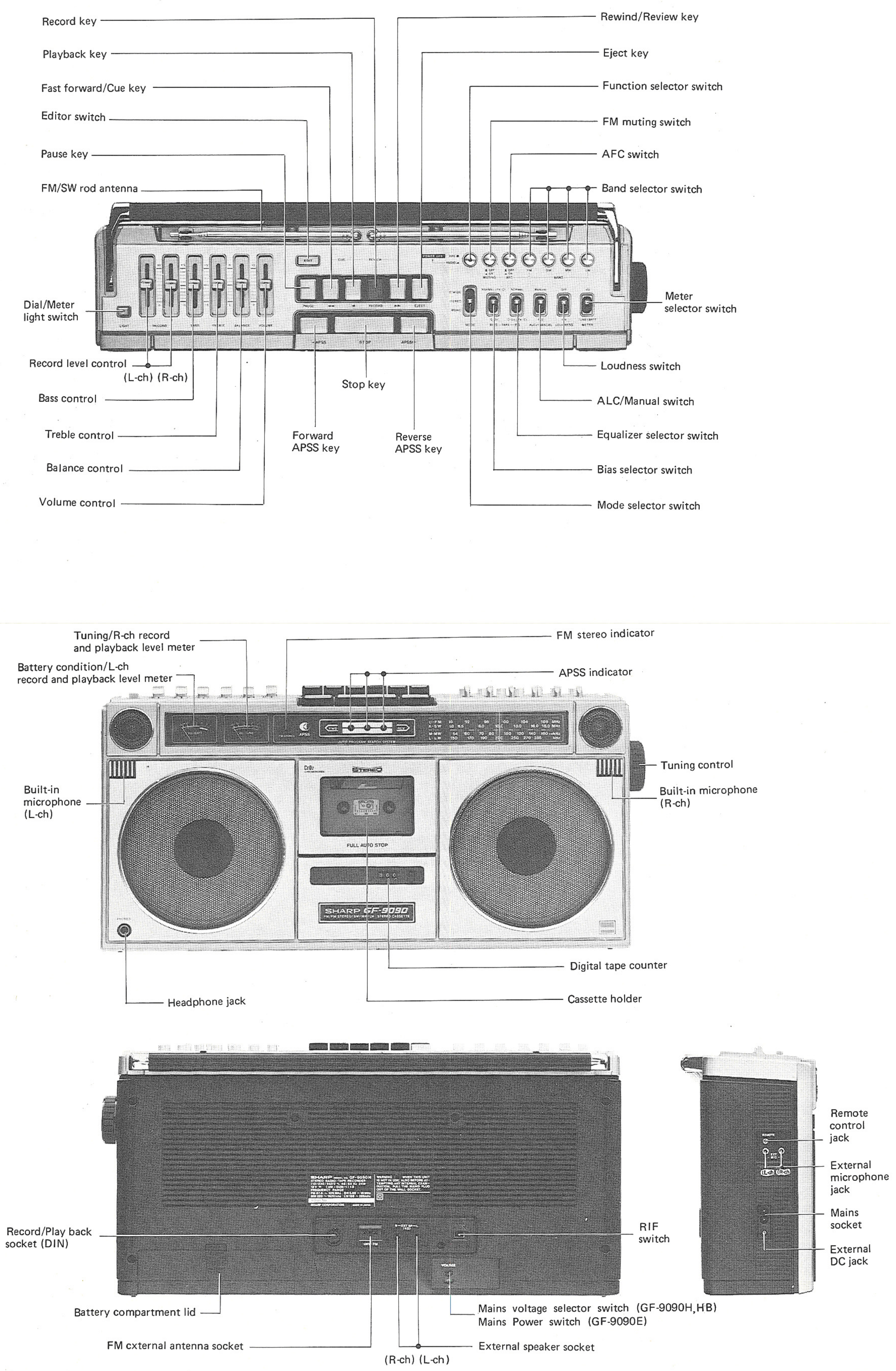

Record key
Playback key
Fast forward/Cue key
Editor switch
Pause key
FM/SW rod antenna
Rewind/Review key
Eject key
Function selector switch
FM muting switch
AFC switch
Band selector switch
Dial/Meter light switch
Meter selector switch
Record level control
(L-ch) (R-ch)
Bass control
Treble control
Balance control
Volume control
Stop key
Forward APSS key
Reverse APSS key
Loudness switch
ALC/Manual switch
Equalizer selector switch
Bias selector switch
Mode selector switch
Tuning/R-ch record and playback level meter
Battery condition/L-ch record and playback level meter
FM stereo indicator
APSS indicator
Tuning control
Built-in microphone (L-ch)
Built-in microphone (R-ch)
Digital tape counter
Headphone jack
Cassette holder
SHARP GF-9090
Record/Play back socket (DIN)
RIF switch
Battery compartment lid
Mains voltage selector switch (GF-9090H,HB)
Mains Power switch (GF-9090E)
FM cxternal antenna socket
External speaker socket
(R-ch) (L-ch)
Remote control jack
External microphone jack
Mains socket
External DC jack

Figure 1

DISASSEMBLY

A ⇒ B ⇒ C ⇒ D ⇒ E

A FRONT CABINET REMOVAL (Refer to Figures 2 and 3)

1. Pull out the power cord plug or adaptor plug from the unit.
2. Take out the cassette tape from the cassette holder.
3. Remove the battery compartment lid and eight (8) batteries from the battery compartment.
4. Remove eight (8) screws retaining the front cabinet.
5. Gently pull out the front cabinet and disconnect four (4) tips (Speaker) connected to the main P.W. board.

B OPERATION PANEL REMOVAL (Refer to Figure 2)

1. Remove the front cabinet as described in front cabinet removal.
2. Remove six (6) knobs (VOLUME, BALANCE, TREBLE, BASS and RECORD).
3. Remove four (4) screws retaining the operation panel.
4. Gently lift up the operation panel from the back cabinet.

C DIAL SCALE PLATE REMOVAL (Refer to Figure 3)

1. Remove the operation panel as described in operation panel removal.
2. Remove four (4) screws retaining the dial scale plate.
3. Gently pull out the dial scale plate from the chassis.

D MECHANISM BLOCK REMOVAL (Refer to Figure 4)

1. Remove the dial scale plate as described in dial scale plate removal.
2. Disconnect the tip (Muting) and two (2) sockets (SO2, SO501) connected to the main P.W. board and the motor P.W. board.
3. Remove four (4) screws retaining the mechanism block.
4. Gently pull out the mechanism block form the back cabinet.

E CHASSIS (P.W.B.) REMOVAL (Refer to Figure 5)

1. Remove the mechanism block as described in mechanism block removal.
2. Remove the tuning knob from the tuning shaft.
3. Disconnect two (2) tips (Antenna) connected to the main P.W. board.
4. Remove six (6) screws retaining the chassis (P.W.B.).
5. Gently pull out the chassis (P.W.B.) from the back cabinet.

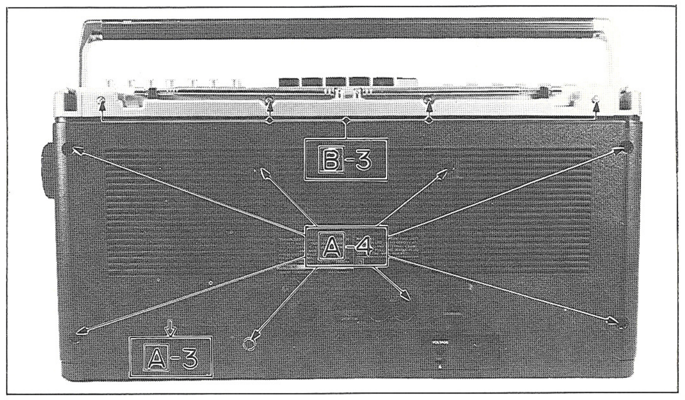


Figure 2

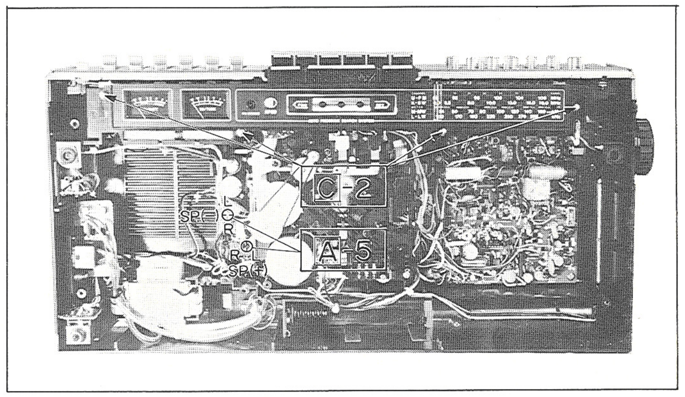


Figure 3

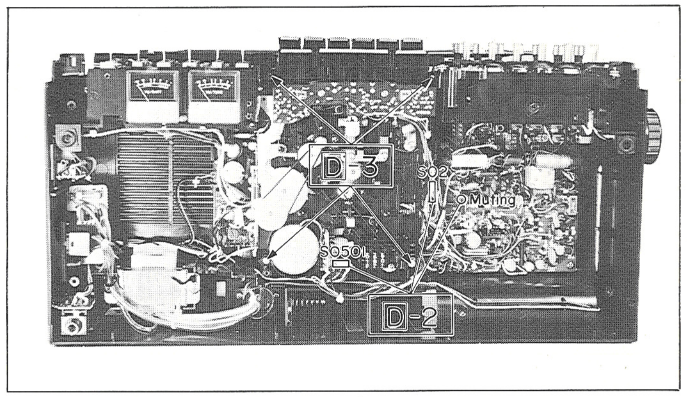


Figure 4

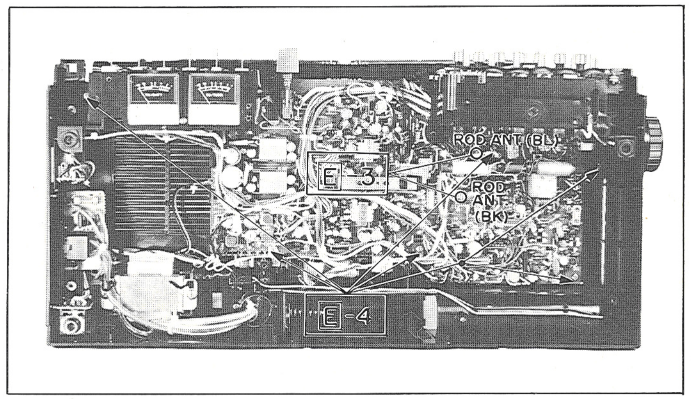


Figure 5

OPERATION ON MAINS

GF-9090H, HB

- Before operating the unit on mains, check the pre-set voltage. If the voltage is different from your local voltage, adjust the voltage as follows: Rotate the plug of the voltage selector by using a screwdriver so that your local voltage number can be seen. (Refer to Figure 6)

GF-9090E

- Switch the mains power switch to the "ON" position.
- When the unit is used on batteries, pull out the mains plug from the unit. Otherwise switch off at the mains power switch after use. (Refer to Figure 6)

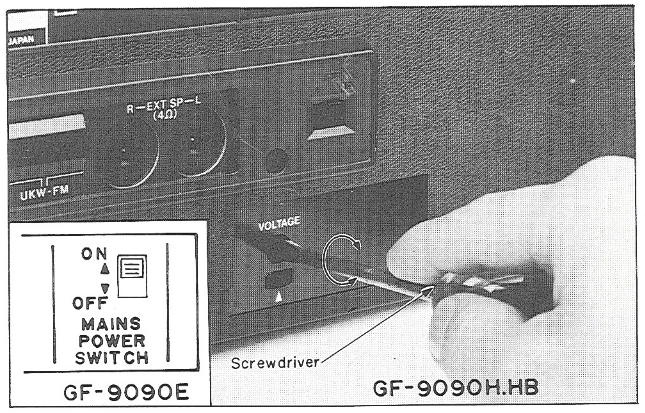


Figure 6

DIAL CORD STRINGING

(Refer to Figure 7)

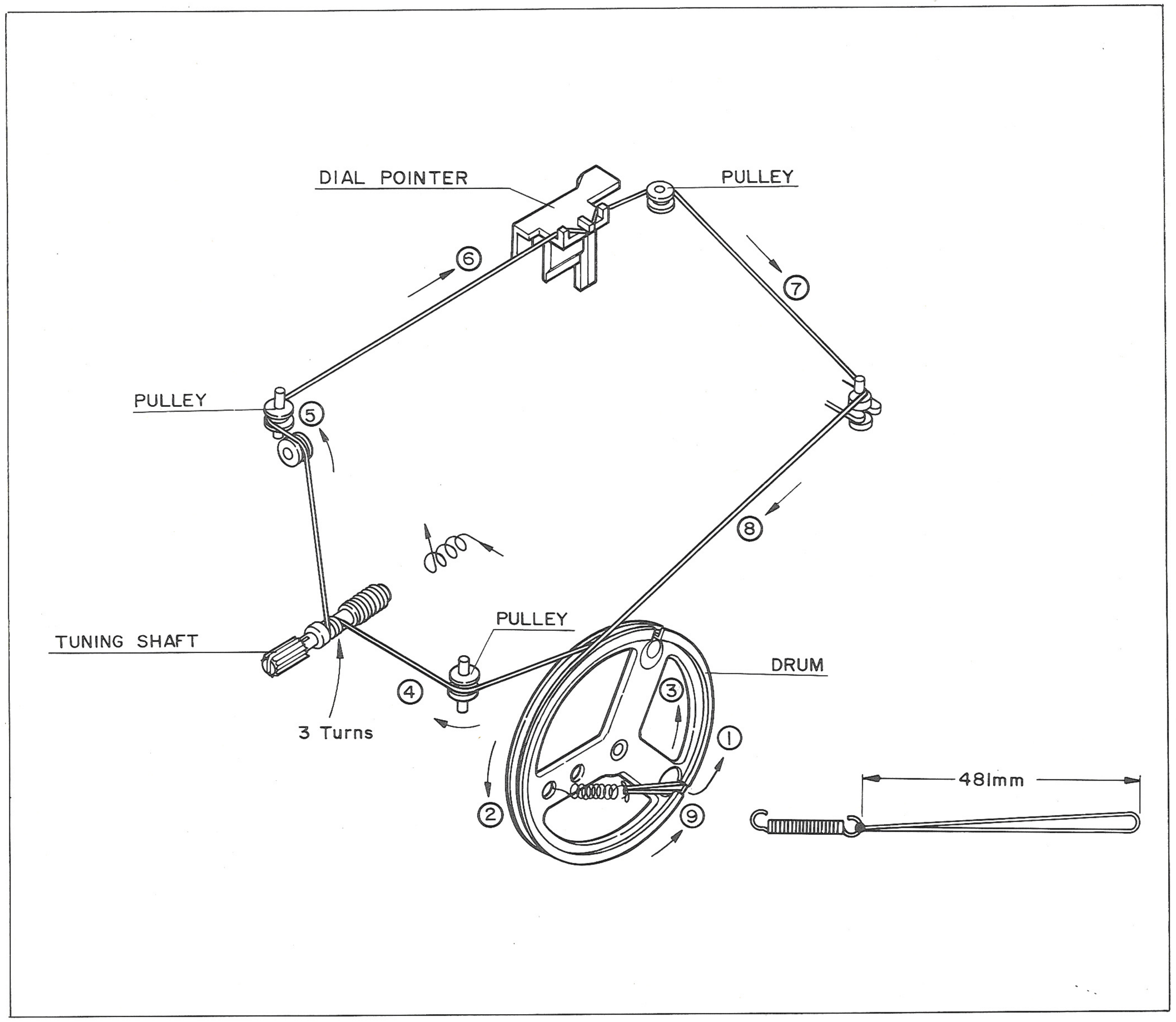


Figure 7

DESCRIPTION OF APSS

APSS is the abbreviation of Automatic Program Search System that permits advancing the tape past an unwanted selection to the beginning of the next program automatically with one push of a key. In this machine, the APSS in the reverse direction is also realized besides that in the forward play. That is to say, this unit is equipped FWD.-APSS key (◀) and REV.-APSS key (▶). In playback mode when the FWD.-APSS key is depressed the tape is fed at a high speed and is slowed down to a regular play speed at the beginning of the next selection. Or, when the REV.-APSS key is depressed the tape is rewound at a high speed and is set to regular playback mode at the beginning of the selected program. The following explanation refers to the function of the APSS.

FUNCTION OF APSS

When the FWD.-APSS key is depressed in playback mode of the tape, the pinch roller is cleared from the flywheel shaft and the roller assembly meshes with the gear of the take-up turntable permitting the tape to advance at a normal fast forward speed. On the other hand, when the FWD.-APSS key is depressed, the FWD.-APSS switch (SW501) is turned "ON" so that +12V power be applied, via D509, to the APSS indicator circuit ①, muting circuit ② and APSS detection circuit ③ .

① APSS INDICATOR CIRCUIT

(Refer to Figures 8, 9, 10 and 11)

With the APSS indicator circuit being given +12V power, the multi-vibrator (Q502 and Q501) starts to oscillate to n Hz (about 2 Hz) and output of the multi-vibrator will be applied to the flip-flop circuit (Q503 and Q504) to be 1/2 divided into 1/2n Hz (about 1 Hz). These outputs of the multi-vibrator and flip-flop circuit are to light up the light emitting diodes D513, D512 and D511 through the logical circuit (D501 to D506). Figure 10 is a timing chart concerning the above operation.

In Figure 10, 1) and 2) are output waveformes of the multi-vibrator (Q502 and Q501), and 3) and 4) are those of the flip-flop circuit (Q503 and Q504). Using these four (4) waveforms, the logical circuit is to further create waveforms 5), 6) and 7) to have the light emitting diodes light up.

The horizontal axis shown in Figure 10 refers to a time axis: the light emitting diodes D513, D512 and D511 light up in this order one after another, respectively at the periods a, b and c. Meanwhile, at the period d, all the light emitting diodes are kept off. The periods a to d are considered one cycle of the light-up operation and this cycle is repeated: the light-up operation looks as if it moved from right to left.

Q505 and Q506 are switching transistors. When the FWD.-APSS key is depressed, the Q505 will be turned "ON" while the Q506 will do so when the REV.-APSS key is depressed. As for the REV.-APSS operation mode, the light emitting diodes D511, D512 and D513 light up in this order one after another, respectively at the periods a, b and c --- the light-up operation looks as if it moved from left to right.

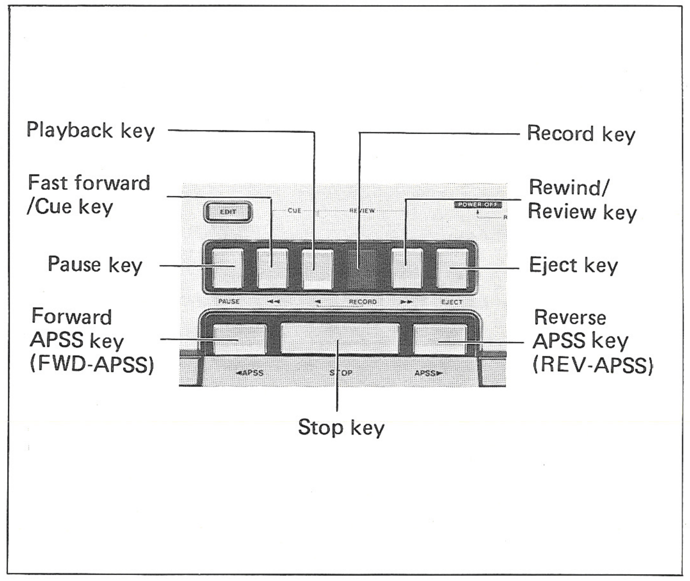

Playback key
Fast forward /Cue key
Pause key
Forward APSS key (FWD-APSS)
Record key
Rewind/ Review key
Eject key
Reverse APSS key (REV-APSS)
Stop key
EDIT
CUE
REVIEW
PAUSE
RECORD
EJECT
APSS
STOP
APSS

Figure 8 FUNCTION KEY LAYOUT

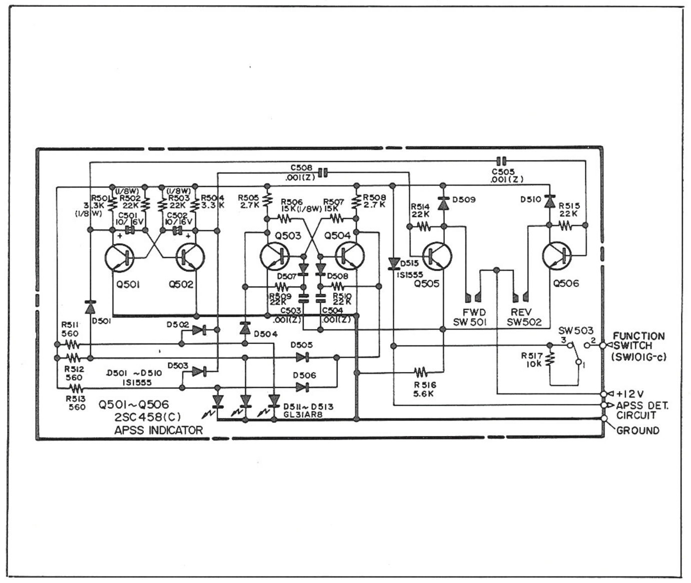

C508 .001(Z)
C505 .001(Z)
Q501
Q502
Q503
Q504
Q505
Q506
D509
D510
R514 22K
R515 22K
D515 1S1555
FWD SW501
REV SW502
SW503
FUNCTION SWITCH (SW101G-c)
R517 10K
R516 5.6K
R511 560
R512 560
R513 560
D501~D510 1S1555
Q501~Q506 2SC458(C)
APSS INDICATOR
D511~D513 GL3IAR8
+12V
APSS DET. CIRCUIT
GROUND

Figure 9 APSS INDICATOR CIRCUIT

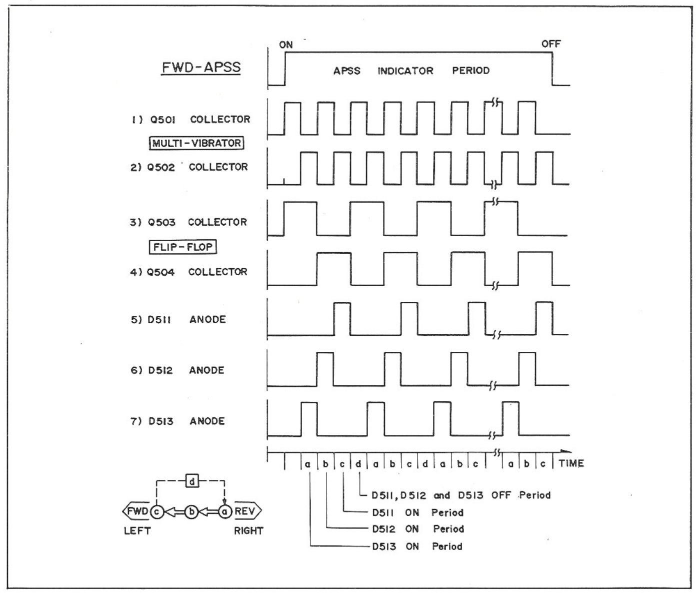

FWD-APSS
ON
OFF
APSS INDICATOR PERIOD
1) Q501 COLLECTOR
MULTI-VIBRATOR
2) Q502 COLLECTOR
3) Q503 COLLECTOR
FLIP-FLOP
4) Q504 COLLECTOR
5) D511 ANODE
6) D512 ANODE
7) D513 ANODE
a b c d a b c d a b c a b c
TIME
d
FWD
REV
LEFT
RIGHT
D511, D512 and D513 OFF Period
D511 ON Period
D512 ON Period
D513 ON Period

Figure 10 FWD-APSS IND. TIMING CHART

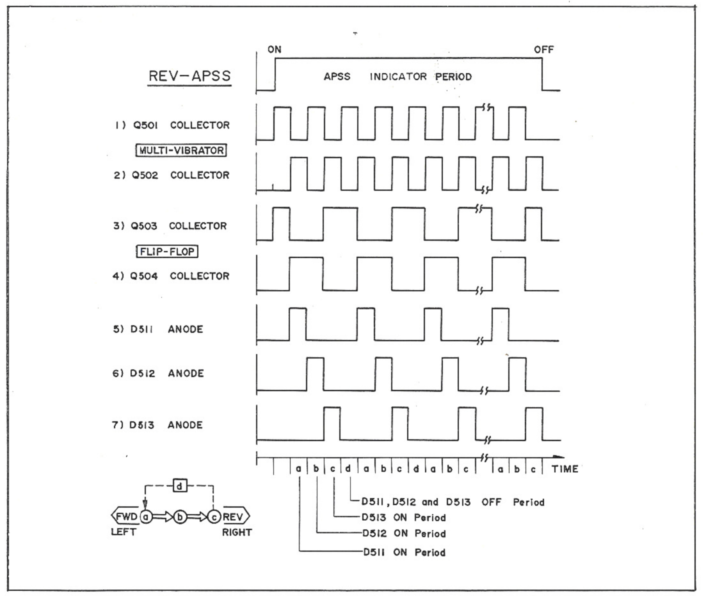

REV-APSS
ON
OFF
APSS INDICATOR PERIOD
1) Q501 COLLECTOR
MULTI-VIBRATOR
2) Q502 COLLECTOR
3) Q503 COLLECTOR
FLIP-FLOP
4) Q504 COLLECTOR
5) D511 ANODE
6) D512 ANODE
7) D513 ANODE
a b c d a b c d a b c a b c
TIME
d
FWD
REV
LEFT
RIGHT
D511, D512 and D513 OFF Period
D513 ON Period
D512 ON Period
D511 ON Period

Figure 11 REV-APSS IND. TIMING CHART

② MUTING CIRCUIT (Refer to Figure 12)

The current fed to the muting circuit turns "ON" the muting transistor (Q302 and Q305) and attenuates the signal from head to hold back the monitor noise.

③ APSS DETECTION CIRCUIT

(Refer to Figures 13, 14 and 15)

The current fed to the APSS detection circuit drives the tape playback signal given from the record/playback head into the APSS pre-amp (IC401) through the equalizer amp (Q201 to Q204) and APSS mixer (Q205), turning "ON" the Q401, and now the signal is amplified to exceed VBE (voltage between base and emitter) and charges the C406 up to +12 volts.

Next, when the Q402 is turned "ON", the Q403 is turned "OFF", and the potential of the Q403 collector stabilizes at +12 volts. Therefore the Q404 is not turned "ON", in consequence, neither is the Q405. As a result, the plunger is not actuated. In other words, as far as the tape carries signals the plunger does not work, that is, the tape is continuously fast forwarded according to the mechanism of the APSS. Meanwhile, when there is no signal on the tape, the potential, even if amplified by the equalizer amp (Q201 to Q204) and APSS pre-amp (IC401), becomes lower than VBE of Q401, which, therefore, is turned "OFF", and the electric charge of C406 (determined by the value of R405 and C406) is discharged at the time constant. When the potential of C406 is discharged to be below VBE of Q402, the Q402 is turned "OFF" and the Q403 is activated. Therefore, the collector potential of Q403 becomes zero (0) volt and, consequently, the +12-volt voltage passes through the R412, allowing a discharge current to flow towards the C407. By this discharge current the potential of the Q404 base drops momentarily to zero (0) volt, and the Q404 is turned "ON".

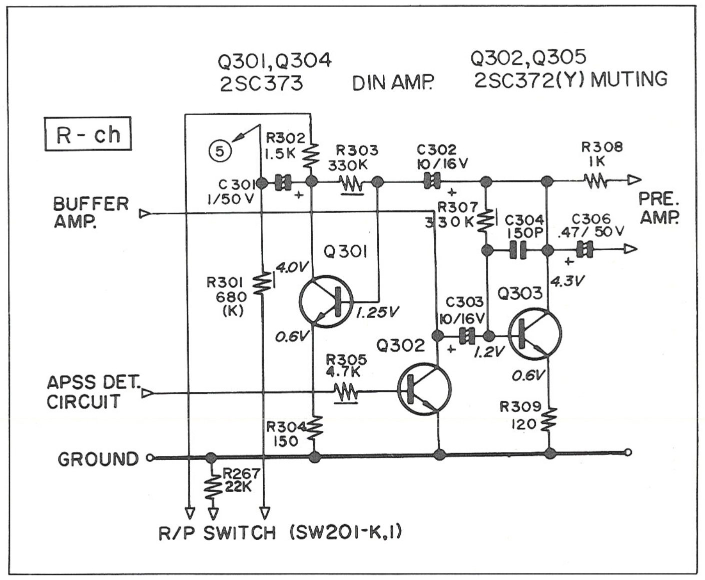

Q301,Q304
2SC373
DIN AMP.
Q302,Q305
2SC372(Y) MUTING
R-ch
5
R302 1.5K
R303 330K
C302 10/16V
R308 1K
BUFFER AMP.
C301 1/50V
R307 330K
C304 150P
C306 47/50V
PRE. AMP.
Q301
R301 680 (K)
4.0V
1.25V
0.6V
C303 10/16V
Q303
4.3V
Q302
1.2V
R305 4.7K
0.6V
APSS DET. CIRCUIT
R309 120
R304 150
GROUND
R267 22K
R/P SWITCH (SW201-K,I)

Figure 12 MUTING CIRCUIT

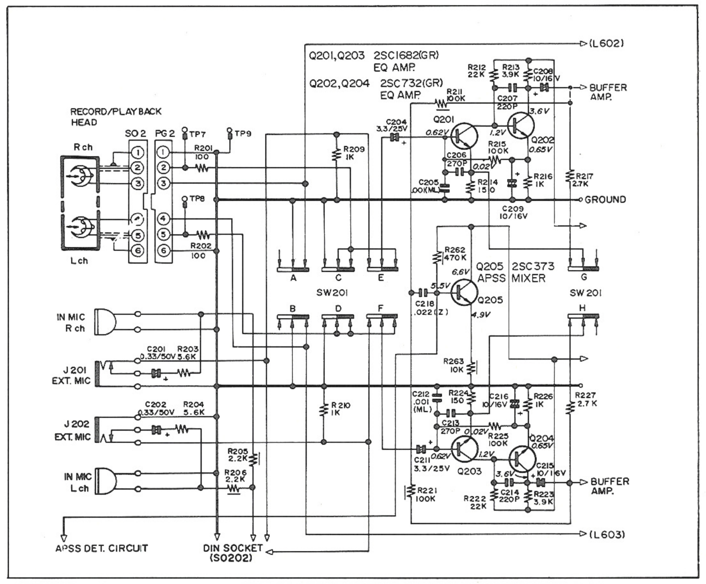

Q201,Q203 2SC1682(GR) EQ AMP.
Q202,Q204 2SC732(GR) EQ AMP.
(L602)
BUFFER AMP.
RECORD/PLAYBACK HEAD
R ch
L ch
S02
PG2
TP7
TP9
TP8
Q201
Q202
Q203
Q204
Q205 2SC373 APSS MIXER
SW201
A C E
B D F
G
H
IN MIC R ch
J201 EXT. MIC
J202 EXT. MIC
IN MIC L ch
GROUND
BUFFER AMP.
(L603)
APSS DET. CIRCUIT
DIN SOCKET (S0202)

Figure 13 EQ AMP.

Accordingly, the potential of the C407 is permitted to be stabilized from zero (0) volt to +12 volts. When the potential exceeds VBE, the Q404 is turned "OFF". Then the Q404 is turned "ON", and +B is supplied to the base of Q405 through the R414, turning "ON" the Q405. Then, an end of the plunger is grounded and +12V is applied to the plunger, which, in turn, is actuated. When the Q404 is turned "OFF", the Q405 is also turned "OFF", cutting off the potential to the plunger. When the plunger is put in action, the APSS lockplate is stretched out to release the FWD-APSS key. Consequently, the FWD-APSS switch (SW501) is turned "OFF" and the pinch roller is pressed hard against the flywheel shaft. Moreover, the fastforwarding gear is disengaged from the gear of the takeup turntable, setting the unit in normal playback mode again. As the FWD-APSS switch (SW501) is turned "OFF", the light emitting diodes of D513, D512 and D511 stops flickering and the APSS limiter circuit is made inactive. Further, the muting circuit of Q302 and Q305 also stops its function.

In the meantime, when the REV-APSS key is depressed the fast-forwarding gear meshes with the gear of supply turntable and the REV-APSS switch (SW502) is turned "ON" to set the tape in rewind mode, permitting the light emitting diodes of D511, D512 and D513 to flicker. The successive function is just as in the case of FWD-APSS behavior.

This ends the explanation of the APSS performance.

Note However, that the APSS may malfunction when either one of following recordings is played back, but, remember, this is not a trouble.

1. A prolonged portion of pianissimo in music.
2. A blank portion in the midst of music (more than 3 seconds when measured in playback).
   * In cases 1 & 2 the FWD-APSS or REV-APSS key, if depressed, resets itself and regular playback mode is resumed.
3. A too short interval between programs (about 1 second when measured in playback).
4. A noisy hum or buzz recorded in a blank portion.
   * In cases 3 & 4 the condition doesn't allow the APSS circuit to work easily, and the blank portion couldn't be detected.
5. FWD-APSS key depressed within 10 seconds (as measured in playback) from the end of a preceding selection.
6. REV-APSS key depressed within 10 seconds (as measured in playback) from the beginning of a selection.
   * In cases 5 & 6 the tape runs 10 or 30 times as fast as in playback mode if the FWD-APSS or REV-APSS key is depressed, therefore the tape skips a blank portion while the key is being depressed.

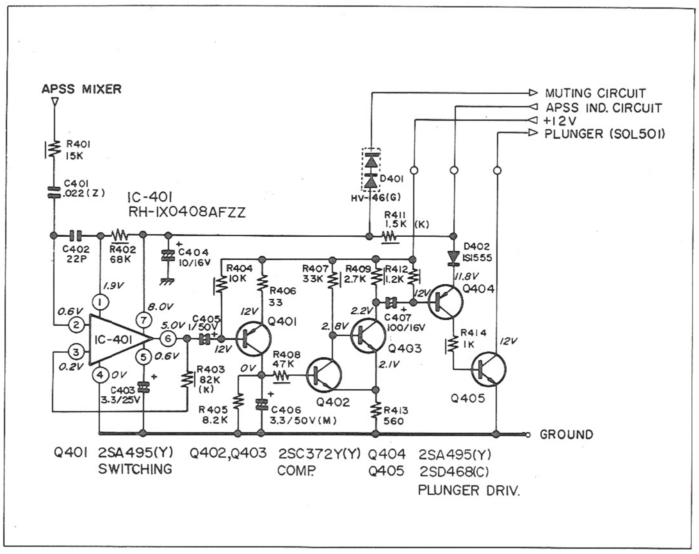

APSS MIXER
R401 15K
C401 .022(Z)
IC-401 RH-IX0408AFZZ
C402 22P
R402 68K
C404 10/16V
1.9V
0.6V
8.0V
5.0V
C405 1/50V
0.2V
0.6V
0V
C403 3.3/25V
R403 82K (K)
R404 10K
R406 33
12V
Q401
R405 8.2K
R408 47K
C406 3.3/50V(M)
Q402
R407 33K
R409 2.7K
R412 1.2K
2.2V
2.8V
2.1V
C407 100/16V
Q403
R413 560
D401 HV-46(G)
R411 1.5K (K)
D402 IS1555
11.8V
Q404
R414 1K
Q405
MUTING CIRCUIT
APSS IND. CIRCUIT
+12V
PLUNGER (SOL501)
GROUND
Q401 2SA495(Y) SWITCHING
Q402,Q403 2SC372Y(Y) COMP.
Q404 2SA495(Y)
Q405 2SD468(C) PLUNGER DRIV.

Figure 14 APSS DETECTION CIRCUIT

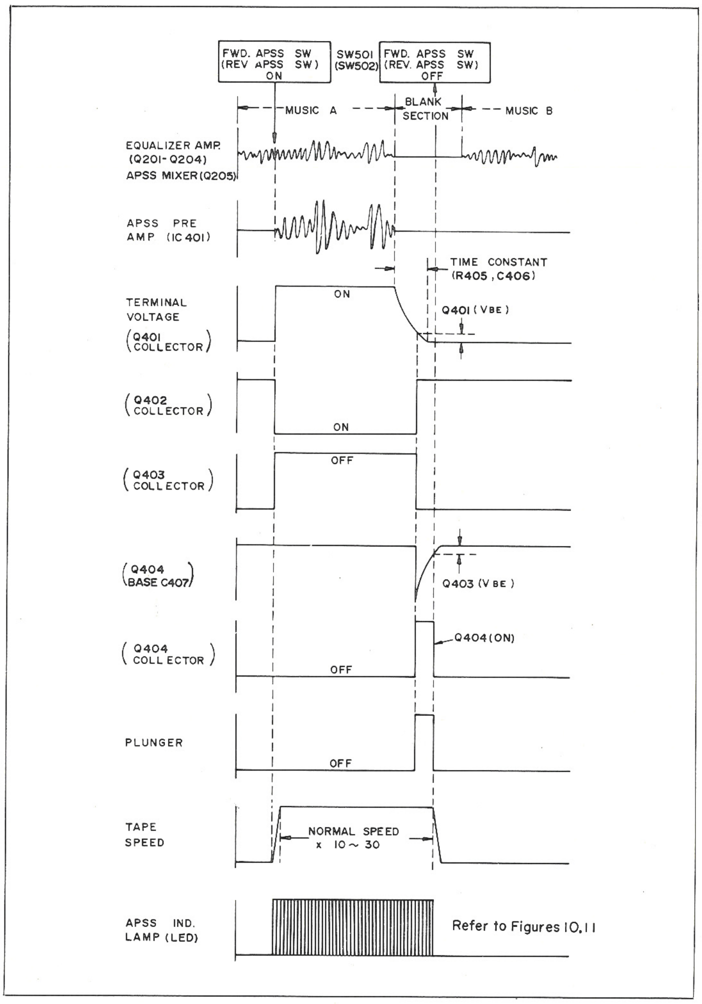

FWD. APSS SW (REV APSS SW) ON
SW501 (SW502)
FWD. APSS SW (REV. APSS SW) OFF
MUSIC A
BLANK SECTION
MUSIC B
EQUALIZER AMP. (Q201-Q204)
APSS MIXER(Q205)
APSS PRE AMP (IC401)
TIME CONSTANT (R405, C406)
TERMINAL VOLTAGE
(Q401 COLLECTOR)
ON
Q401 (VBE)
(Q402 COLLECTOR)
ON
(Q403 COLLECTOR)
OFF
(Q404 BASE C407)
Q403 (VBE)
(Q404 COLLECTOR)
OFF
Q404(ON)
PLUNGER
OFF
TAPE SPEED
NORMAL SPEED x 10 ~ 30
APSS IND. LAMP (LED)
Refer to Figures 10, 11

Figure 15 APSS MOVEMENT PRINCIPLE

MECHANICAL ADJUSTMENT

■ PLAY ADJUSTMENT OF FLYWHEEL SHAFT THRUST

(Refer to Figure 16)

1. Slowly rotate the flywheel shaft thrust play adjusting screw clockwise until there will be no thrust play.
2. Next, rotate the thrust play adjusting screw about 1/4 of its full turn counter clokwise. (Since 1 pitch of the adjusting screw refers to 0.8 mm, the thrust play thus created becomes 0.1 mm to 0.3 mm.)

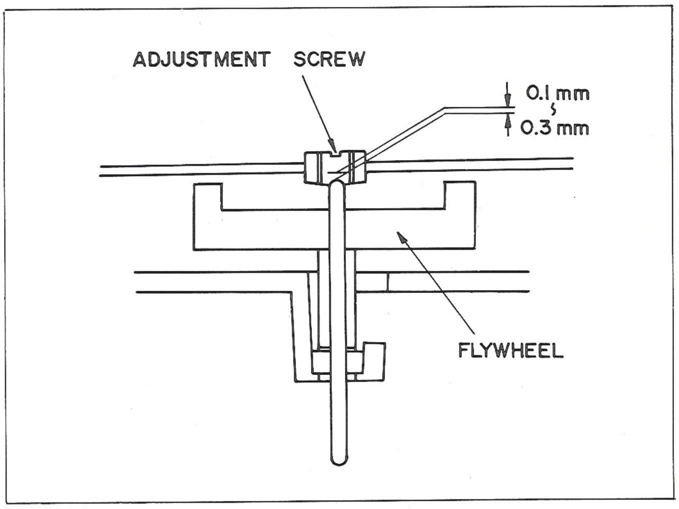


Figure 16

■ PINCH ROLLER PRESSURE ADJUSTMENT

(Refer to Figure 17)

1. Set the unit in PLAY mode.
2. Push the point Ⓐ with use of tension gauge (0 gr. to 500 gr.) to make the pinch roller apart from the flywheel shaft. Then, check that the tension gauge will read 300 gr. to 400 gr. when the pinch roller stops to rotate.
3. As a result of the check in the step 2 above, if the reading is found outside the range of 300 gr. to 400 gr., adjust the pressure spring of pinch roller by bending it or replace.

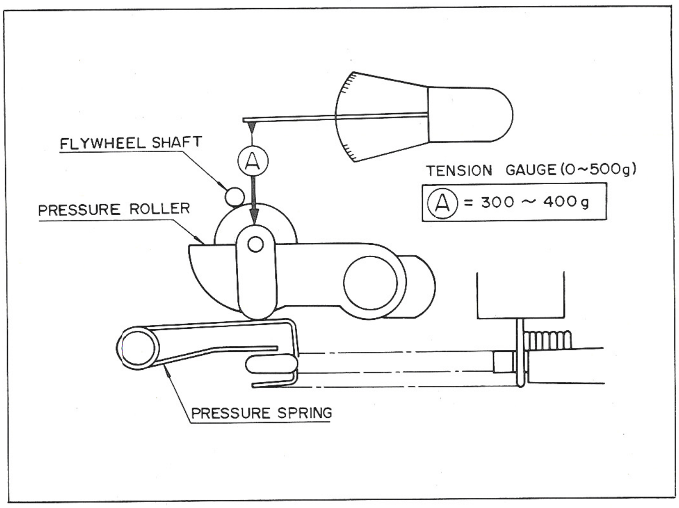


Figure 17

■ OPERATION CHECK OF FWD-APSS AND REV-APSS MECHANISMS

(Refer to Figures 42 and 43, Page 29 and 30)

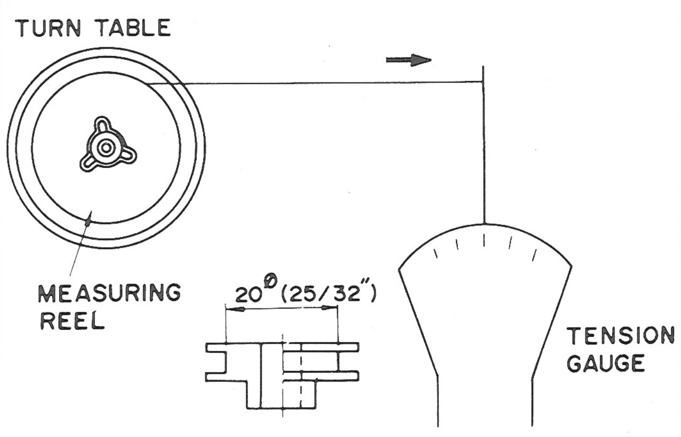
Under PLAY mode, slowly push the FWD-APSS key or REV-APSS key to make sure that the pinch roller (090) and the take-up idler (028) come off respectively from the flywheel shaft and the take-up turntable support (081), and simultaneously the sub-chassis (011) moves 1 mm to 1.5 mm, and further that thereafter, the roller assembly (089) is pressed against the take-up turntable support (081) or the supply turntable support (082). Moreover, when the FWD-APSS key or REV-APSS key is released by pushing the FF (CUE) key or the REWIND (REVIEW) key, make ascertain that the sub-chassis (011) is reset and the unit gets in PLAY mode.

■ TORQUE MEASUREMENT AT PLAY, FF AND REWIND MODES

(Refer to Figure 18)

1. Mount a torque measuring reel on the reel support (that is, it is placed on the take-up turntable support at PLAY/REWIND mode while on the supply turntable support at REWIND mode).
2. Then gradually release the tension gauge and read it when the rotational speed of the reel support becomes almost constant.
3. Measured torques at each mode should be as tabulated below.

   Note: When the take-up turntable support is stopped at PLAY mode, there should be no slip between the take-up turntable support and take-up slip roller and/or between the drive belt and take-up slip roller.



MODE	MEASURED TORQUE
PLAY	35 ~ 60 gr.cm
FF	70 ~ 100 gr.cm
REWIND	70 ~ 100 gr.cm

Figure 18

■ GAP ADJUSTMENT BETWEEN MOTOR SWITCH AND BRAKE LEVER

(Refer to Figure 19)

1. Under each of PLAY, FF, and REWIND modes, make ascertain that the motor switch (SW504) is turned "ON" without fail.
2. When the motor is in a stop, check that the gap Ⓐ between the brake lever and the motor switch (SW504) is 2 mm to 3 mm.
3. If the steps 1 and 2 above are still insufficient for the adjustment, the gap can be adjusted by positionally changing the two soldered terminals Ⓑ of motor switch (SW504) located at the motor PWB with use of a soldering iron.

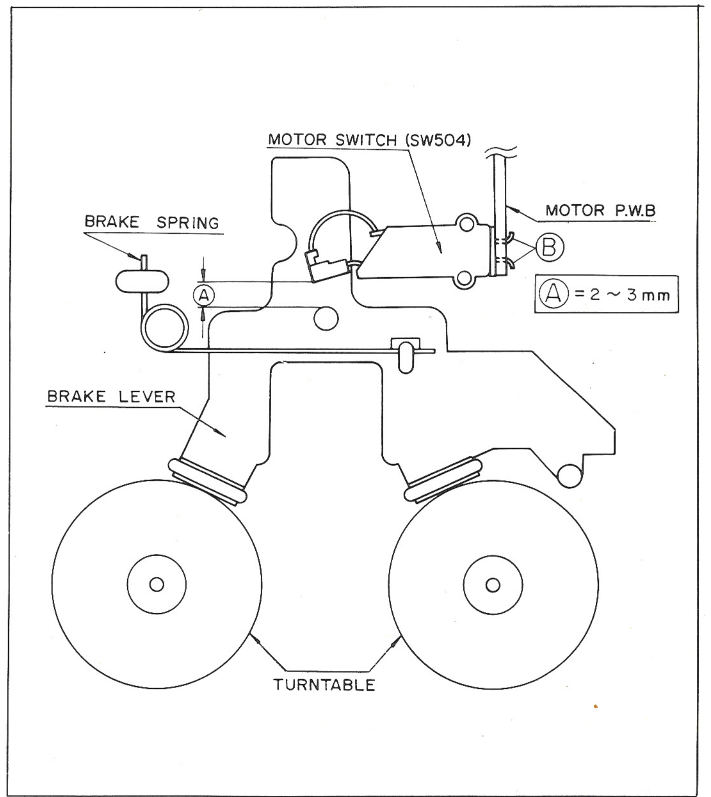


Figure 19

■ OPERATION CHECK OF PAUSE MECHANISM

(Refer to Figure 42, Page 29)

Set the unit in PLAY mode by pushing the key given a mark (◀). Then slowly push the PAUSE key and make ascertain that the take-up idler (028) and the pinch roller (090) come off respectively from the take-up turntable support (081) and the flywheel shaft almost at the same time and check that each of the two gaps thus produced is about 0.5 mm.

■ ADJUSTMENT OF PLUNGER SETTING POSITION

(Refer to Figure 20)

1. Under FF mode, loosen the plunger retaining screw, hold up the part Ⓐ of the plunger by hand and while keeping the plunger in contact with the lock shaft, retighten the plunger retaining screw.
2. After the step 1, make sure of the following.
   - Check that each of the PLAY, FF (CUE), REWIND (REVIEW) keys can be locked smoothly.
   - Check that the FWD-APSS key and REV-APSS key can be locked smoothly and they further be released when the plunger operates.
   - Check that the plunger can start to operate smoothly when the STOP key is pushed to release the APSS keys.
3. After the step 2, the adjustments are not yet sufficient, again carry out the step 1.

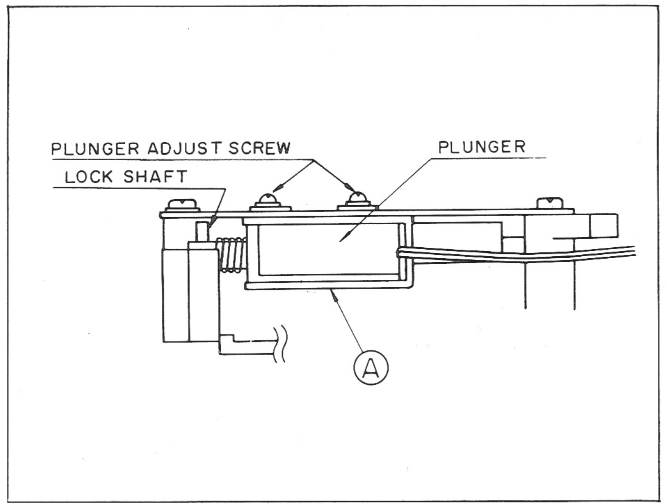


Figure 20

ELECTRICAL MEASUREMENT

- * This unit operaters on DC 12 V. Check that the power supply is exactly 12 V before measurement.
- * Set the FUNCTION switch (SW101G) to "TAPE" position.
- * Refer to Figure 35.

■ RECORD OSCILLATOR BIAS CURRENT AND BIAS FREQUENCY ADJUSTMENT

(Refer to Figure 21)

1. Connect the V.T.V.M. across the 100 ohm resistor (R201, R202).
2. Place the unit in RECORD mode.
3. Adjust the semi-variable resistores (VR601, VR602) so that the V.T.V.M. reads 50 mV for the right channel (R201) and left channel (R202) respectively.
4. Make sure the record oscillator bias frequency is 53 ± 1 kHz.
5. As a result of the check in the step 5 above, if the reading is found outside the 53 ± 1 kHz, adjust the bias oscillation coil (L601)
6. After the step 5, again make sure of the bias current.

SWITCH	POSITION
RIF (SW601)	A
BIAS (SW602)	NORMAL

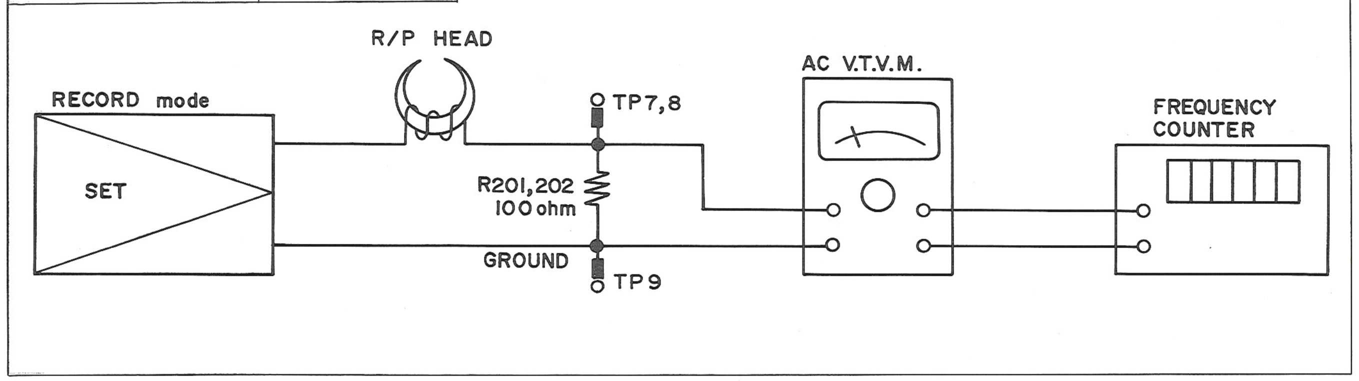

R/P HEAD
RECORD mode
SET
TP7,8
R201,202
100 ohm
GROUND
TP9
AC V.T.V.M.
FREQUENCY
COUNTER

Figure 21

■ ERASE CURRENT CHECK

(Refer to Figure 22)

1. Connect the V.T.V.M. across the 1 ohm resistor (R603).
2. Place the unit in RECORD mode.
3. Make sure the erase current is 90 ± 20 mV.

SWITCH	POSITION
BIAS (SW602)	NORMAL

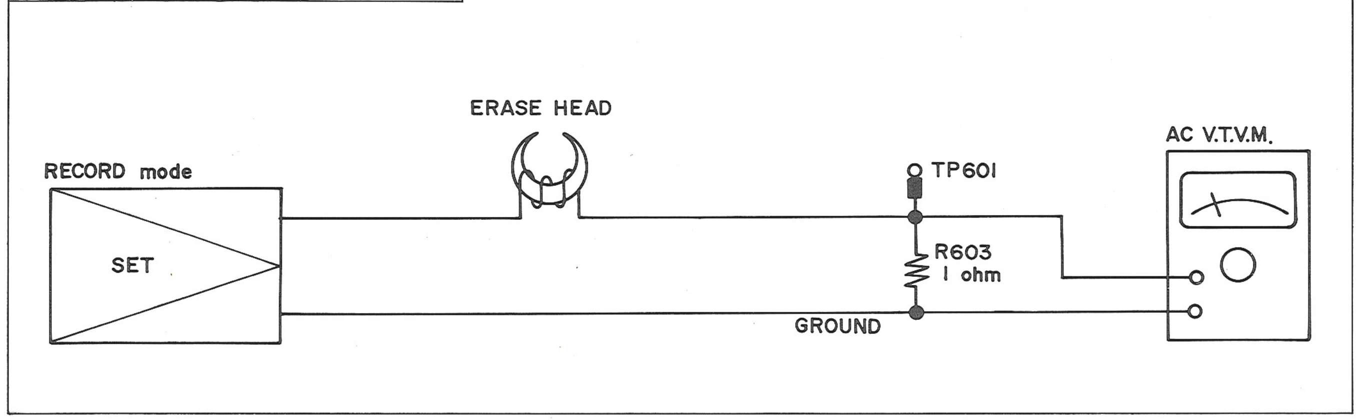

ERASE HEAD
RECORD mode
SET
TP601
R603
1 ohm
GROUND
AC V.T.V.M.

Figure 22

■ RECORD AMPLIFIER SENSITIVITY CHECK

(Refer to Figure 23)

1. Connect the V.T.V.M. across the 100 ohm resistors (R201, R202).
2. Short circuit the primary coil of the oscillation coil (L601) to stop bias oscillator.
3. Connect the signal generator to the EXT. MIC jacks (J201, J202) and apply signals (1000 Hz, −78 dB) to the unit.
4. Place the unit in RECORD mode.
5. If the record amplifier sensitivity is normal, the reading on V.T.V.M. should be approximately 1.75 mV.

SWITCH	POSITION
ALC/MANUAL (SW202)	MANUAL
EQ (SW203)	NORMAL
MODE (SW303)	STEREO
BIAS (SW602)	NORMAL

VR CONTROL	POSITION
RECORD (VR201)	Maximum
RECORD (VR202)	

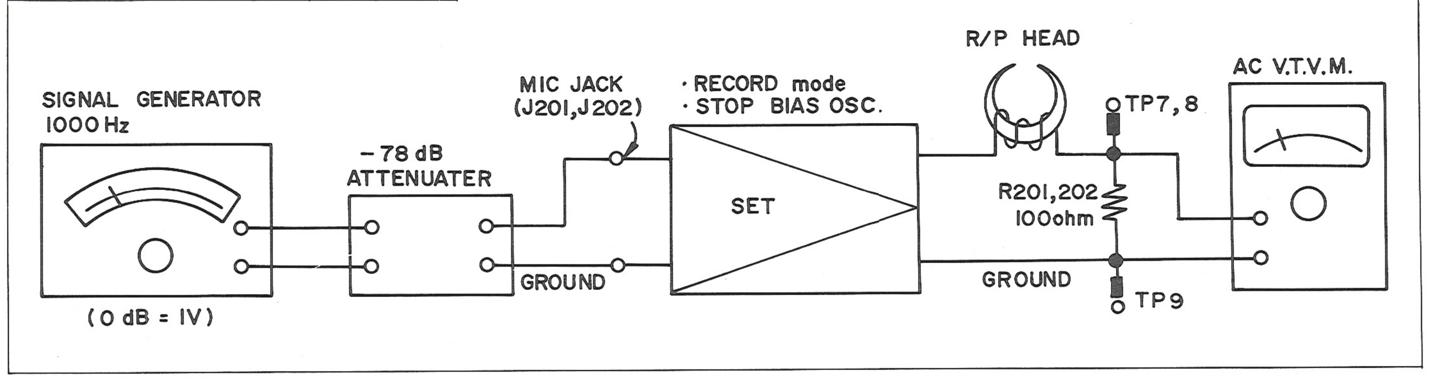

SIGNAL GENERATOR
1000 Hz
(0 dB = 1V)
−78 dB
ATTENUATER
MIC JACK
(J201,J202)
GROUND
· RECORD mode
· STOP BIAS OSC.
SET
R/P HEAD
TP7,8
R201,202
100ohm
GROUND
TP9
AC V.T.V.M.

Figure 23

■ PLAYBACK AMPLIFIER SENSITIVITY CHECK

(Refer to Figure 24)

1. Connect load resistor (4 ohm) to the EXT. SP sockets (SO301, SO302) and further connect the V.T.V.M. thereto.
2. Connect the signal generator across the REC/PB head and apply signals (1000 Hz, −80 dB) to the unit.
3. Place the unit in PLAYBACK mode.
4. If the playback amplifier sensitivity is normal, the reading on the V.T.V.M. should be approximately 0.5 V.

SWITCH	POSITION
EQ (SW203)	NORMAL
MODE (SW303)	STEREO

VR CONTROL	POSITION
VOLUME (VR301)	Mechanical Center
TREBLE (VR302)	
BASS (VR303)	

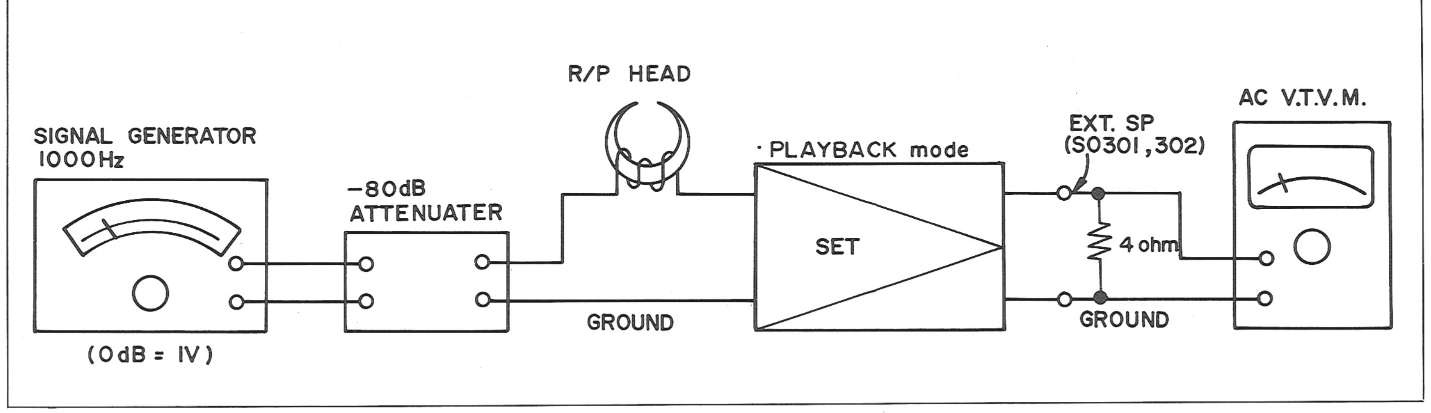

SIGNAL GENERATOR
1000Hz
(0dB = 1V)
−80dB
ATTENUATER
R/P HEAD
GROUND
· PLAYBACK mode
SET
EXT. SP
(SO301,302)
4 ohm
GROUND
AC V.T.V.M.

Figure 24

■ SWING ADJUSTMENT OF VU METER

(Refer to Figures 23 and 25)

1. Apply signals (1 kHz, –60 dB) to the EXT. MIC jacks (J201, J202).
2. Adjust the record volume controls (VR201, VR202) so that the V.T.V.M. reads 3.5 mV.
3. Rotate the semi-variable resistors (VR305, VR306) to adjust so that each of the two VU meters (ME1, ME2) indicates around "0" VU and swings to the same extent in right and left of the position "0" VU.

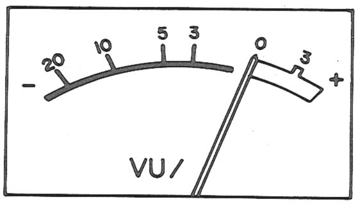


Figure 25

■ RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENT

(Refer to Figure 26.)

1. Connect load resistor (4 ohm) to the EXT. SP sockets (SO301, SO302) and connect outputs of both the right and left channels to the vertical and horizontal input terminals of oscilloscope.
2. Insert the test tape (MTT-114, 10 kHz, –10 dB Recorded).
3. Place the unit in PLAYBACK mode.
4. Adjust the head azimuth adjusting screw so that Lissajou's waveform attains the maximum and the same phase in right and left.
5. Even without using the oscilloscope, also adjust the head azimuth adjusting screw so that outputs of both the right and left channels attain the maximum and the same phase in right and left, and as a result, the output won't be decreased so much considerably even when the MODE switch (SW303) is set to "MONO".

SWITCH	POSITION
MODE (SW303)	STEREO

VR CONTROL	POSITION
VOLUME (VR301)	Maximum
TREBLE (VR302)	Mechanical Center
BASS (VR303)	

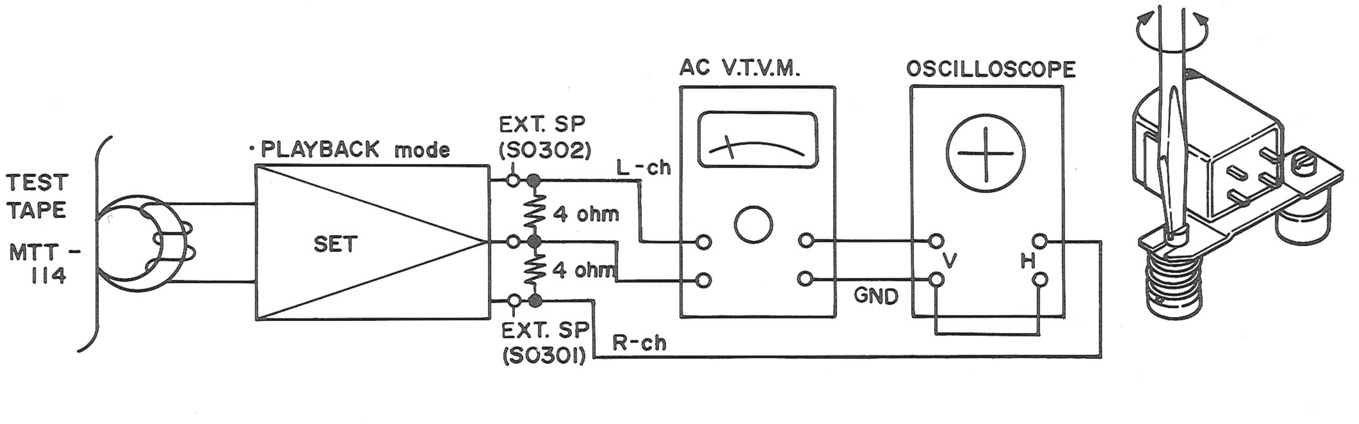


Figure 26

GENERAL ALIGNMENT INSTRUCTION

Should it become necessary at any time to check the alignment of this receiver, proceed as follows;

1. Set the volume control (VR301) to maximum.
2. Attenuate the signals from the generator enough to swing the most sensitive range of the output meter.
3. Use a non-metallic alignment tool.
4. Repeat adjustments to insure good results.
5. Set the FUNCTION switch (SW101G) to "RADIO" position.

THE INSTRUCTION OF FREQUENCY ADJUSTMENT
(GF-9090H, HB)

In order to comply with FTZ rule: Nr. 358/1970, please fix the low end of dial frequency (87.5MHz) and the high end of dial frequency (107.9MHz) on FM band, by adjusting oscillation coils (L3 and L4) and oscillation trimmer (TC4), respectively, as illustrated in Fugure 35.

AM ALIGNMENT CHART

(Refer to Figure 35)

STEP	BAND	TEST STAGE	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
			CONNECTION TO RECEIVER	INPUT SIGNAL REQUENCY	DIAL SETTING	REMARKS	
1	MW	IF	Refer to Figure 27	Exactly 455 kHz. (400 Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Adjust for maximum output.	Adjust the AM IF transformers (T101) (T102)
2	MW	Band Coverage	Refer to Figure 28	Exactly 510 kHz. (400 Hz, 30%, AM modulated)	Low end of dial. (maximum capacity).	Adjust for maximum output.	Adjust the MW oscillation coil (L9).
3	MW		Same as step 2.	Exactly 1650 kHz. (400 Hz, 30%, AM modulated)	High end of dial. (minimum capacity).	Same as step 2.	Adjust the MW oscillation trimmer (TC107).
4	MW	Tracking	Same as step 2.	Exactly 600 kHz. (400 Hz, 30%, AM modulated)	600 kHz.	Same as step 2.	Adjust the MW antenna coil (L7). (See Note A)
5	MW		Same as step 2.	Exactly 1400 kHz. (400 Hz, 30%, AM modulated)	1400 kHz.	Same as step 2.	Adjust the MW antenna trimmer (TC104). (See Note A)
6	MW	Repeat steps 2, 3, 4, and 5 until no further improvement can be made.					
7	LW	Band Coverage	Same as step 2.	Exactly 145 kHz. (400 Hz, 30%, AM modulated)	Low end of dial. (maximum capacity)	Same as step 2.	Adjust the LW oscillation coil (L10).
8	LW		Same as step 2.	Exactly 295 kHz. (400 Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Same as step 2.	Adjust the LW oscillation trimmer (TC108).
9	LW	Tracking	Same as step 2.	Exactly 160 kHz. (400 Hz, 30%, AM modulated)	160 kHz.	Same as step 2.	Adjust the LW antenna coil (L7).
10	LW		Same as step 2.	Exactly 260 kHz. (400 Hz, 30%, AM modulated)	260 kHz.	Same as step 2.	Adjust the LW antenna trimmer (TC105).
11	LW	Repeat steps 7, 8, 9 and 10 until no further improvement can be made.					
12	SW	Band Coverage	Refer to Figure 29	Exactly 5.85 MHz (400 Hz, 30%, AM modulated)	Low end of dial. (maximum capacity)	Same as step 2.	Adjust the SW oscillation coil (L8).
13	SW		Same as step 12.	Exactly 18.5 MHz. (400 Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Same as step 2.	Adjust the SW oscillation trimmer (TC106).

14	SW	Tracking	Same as step 12.	Exactly 6.5 MHz. (400 Hz, 30%, AM modulated)	6.5 MHz	Same as step 2.	Adjust the SW antenna coil (L6).
15	SW		Same as step 12.	Exactly 16 MHz (400 Hz, 30%, AM modulated)	16 MHz	Same as step 2.	Adjust the SW antenna trimmer (TC103).
16	SW	Repeat steps 12, 13, 14 and 15 until no further improvement can be made.					

Note A Check the alignment of the receiver antenna coil by bringing a piece of ferrite (such as a coil slug) near the antenna loop stick, then a piece of brass. If ferrite increases output, loop requires more inductance. If brass increases output, loop requires less inductance. Change loop inductance by sliding the bobbin toward the center of ferrite core to increase inductance, or away to decrease inductance.

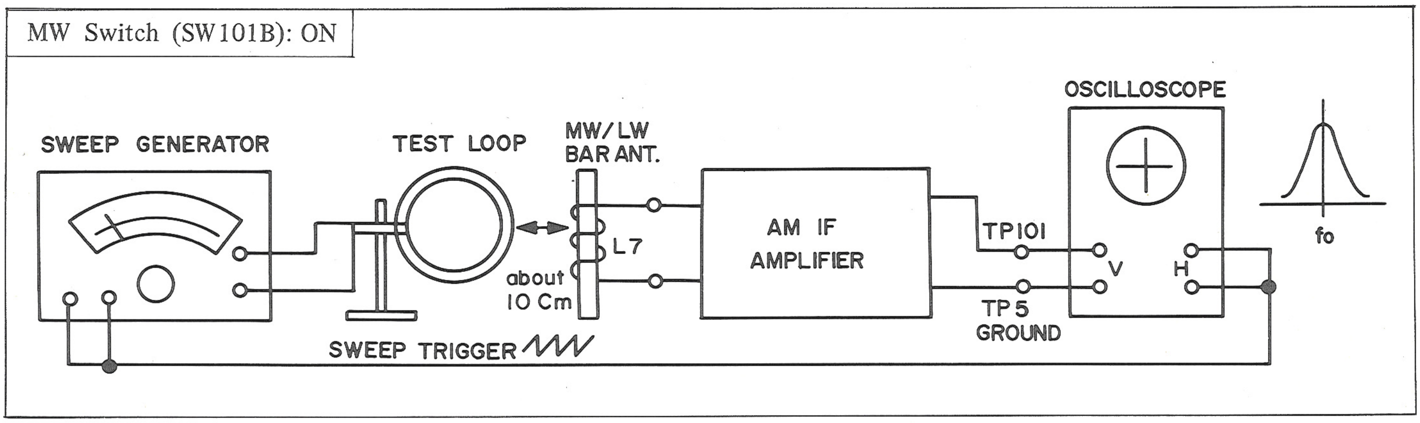

MW Switch (SW101B): ON
SWEEP GENERATOR
TEST LOOP
MW/LW BAR ANT.
L7
about 10 Cm
AM IF AMPLIFIER
TP101
TP5
GROUND
OSCILLOSCOPE
V
H
fo
SWEEP TRIGGER

Figure 27 AM IF ALIGNMENT EQUIPMENT CONNECTION

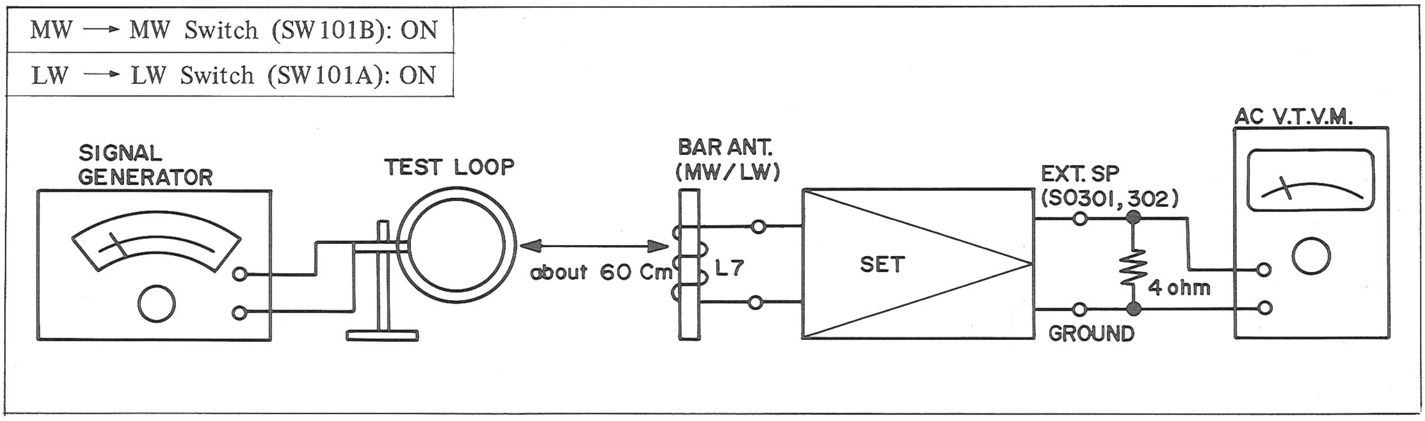

MW → MW Switch (SW101B): ON
LW → LW Switch (SW101A): ON
SIGNAL GENERATOR
TEST LOOP
BAR ANT. (MW/LW)
about 60 Cm
L7
SET
EXT. SP (SO301, 302)
4 ohm
GROUND
AC V.T.V.M.

Figure 28 MW/LW RF ALIGNMENT EQUIPMENT CONNECTION

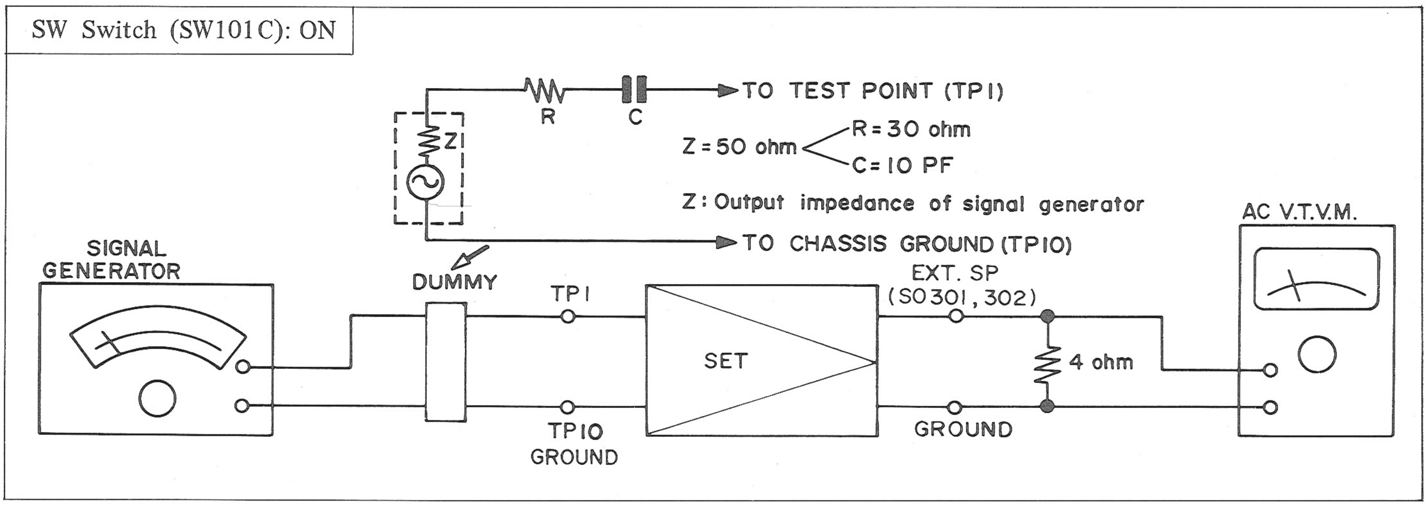

SW Switch (SW101C): ON
R
C
TO TEST POINT (TP1)
Z1
Z = 50 ohm
R = 30 ohm
C = 10 PF
Z: Output impedance of signal generator
TO CHASSIS GROUND (TP10)
SIGNAL GENERATOR
DUMMY
TP1
SET
EXT. SP (SO301, 302)
4 ohm
TP10 GROUND
GROUND
AC V.T.V.M.

Figure 29 SW RF ALIGNMENT EQUIPMENT CONNECTION

FM ALIGNMENT CHART

(Refer to Figure 35)

STEP	TEST STAGE	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
		CONNECTION TO RECEIVER	INPUT SIGNAL REQUENCY	DIAL SETTING	REMARKS	
1	IF	Refer to Figure 30	Exactly 10.7 MHz. (400 Hz, 30%, FM modulated)	High end of dial. (minimum capacity)	Adjust for maximum output.	Adjust the FM IF transformers 1. (T1) 2. (T2)
2	Band Coverage	Refer to Figures 31 and 34	Exactly 87.1 MHz (400 Hz, 30%, FM modulated)	Low end of dial. (maximum capacity)	Adjust for maximum output.	Adjust the FM oscillation coils (L3, L4).
3		Same as step 2.	Exactly 108.5 MHz. (400 Hz, 30%, FM modulated)	High end of dial. (minimum capacity)	Same as step 2.	Adjust the FM oscillation trimmer (TC4).
4	Tracking	Same as step 2.	Exactly 88 MHz. (400 Hz, 30%, FM modulated)	88 MHz	Same as step 2.	Adjust the FM RF coils (L1, L2).
5		Same as step 2.	Exactly 108 MHz. (400 Hz, 30%, FM modulated)	108 MHz	Same as step 2.	Adjust the FM RF trimmer (TC3).
6	Repeat steps 2, 3, 4 and 5 until no further improvement can be made.					

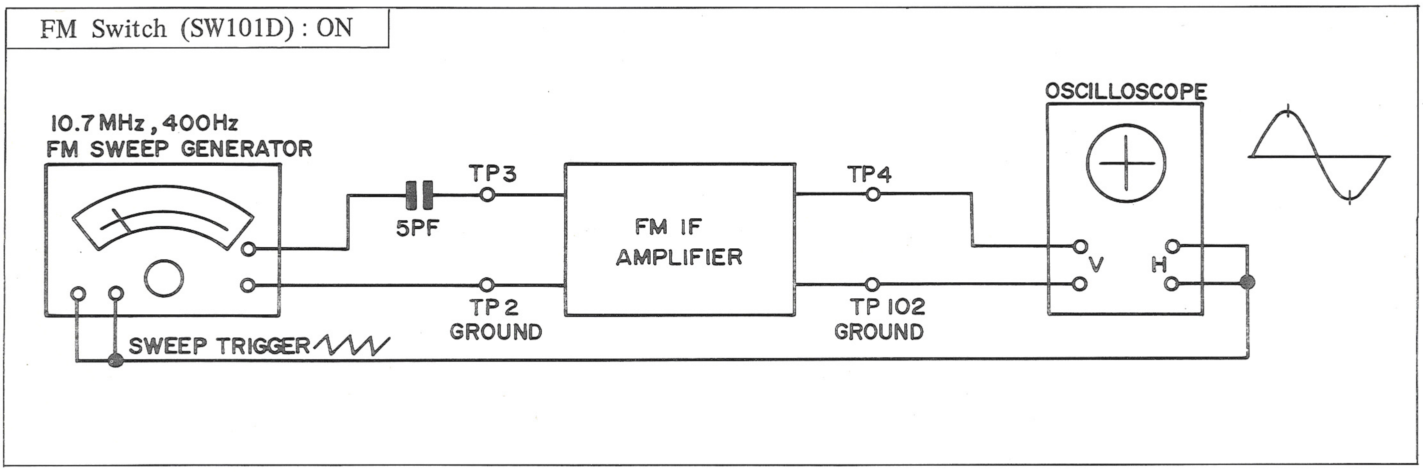

FM Switch (SW101D) : ON
10.7 MHz, 400Hz
FM SWEEP GENERATOR
SWEEP TRIGGER
5PF
TP3
TP2
GROUND
FM IF
AMPLIFIER
TP4
TP 102
GROUND
OSCILLOSCOPE
V
H

Figure 30 FM IF ALIGNMENT EQUIPMENT CONNECTION

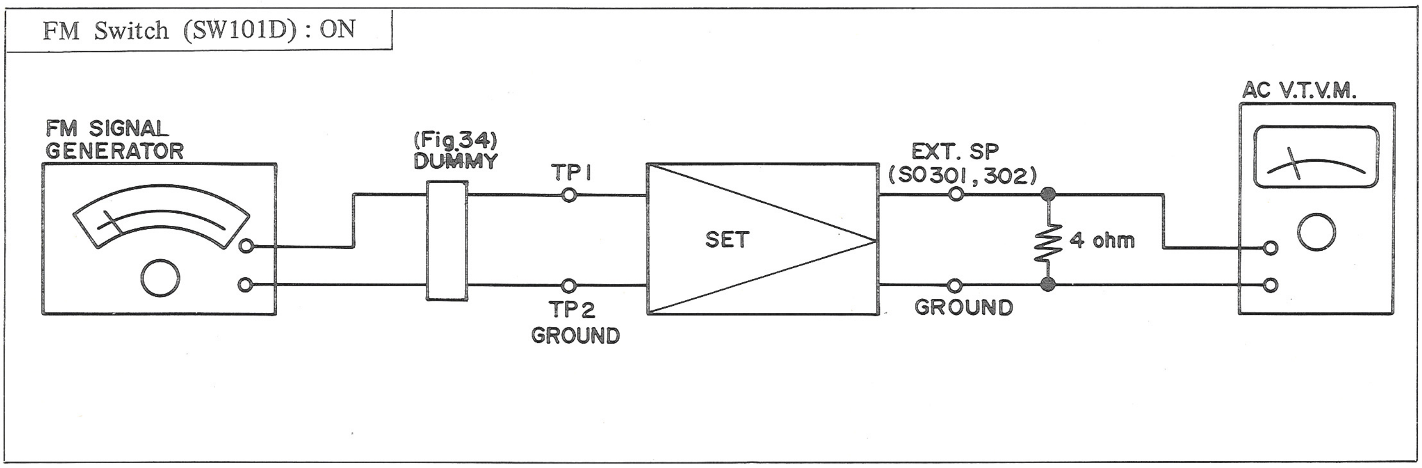
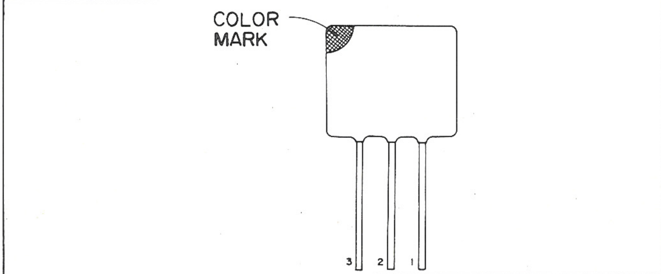

FM Switch (SW101D) : ON
FM SIGNAL
GENERATOR
(Fig.34)
DUMMY
TP1
TP2
GROUND
SET
EXT. SP
(SO301, 302)
4 ohm
GROUND
AC V.T.V.M.

Figure 31 FM RF ALIGNMENT EQUIPMENT CONNECTION

Note B (Refer to Figure 32)
There are 5 kinds of ceramic filters (CF101, CF102) available with this unit and they are given color indication as tabulated below to differentiate the central frequency from one to another among them. When using them, be sure to make the two of the same type a pair.
When other ceramic filters than the one (red) having the central frequency of 10.7 MHz are used, note that a marker (10.7 MHz) of FM sweep generator, if used, will be deviated -- therefore, adjust the generator by putting off the marker.


COLOR MARK
3
2
1

Central frequency (fo)	D	Black:	10.64 MHz ± 30 kHz
	B	Blue:	10.67 MHz ± 30 kHz
	A	Red:	10.70 MHz ± 30 kHz
	C	Orange:	10.73 MHz ± 30 kHz
	E	White:	10.76 MHz ± 30 kHz

Figure 32

FM MPX ALIGNMENT CHART

* P.L.L. (Phase Locked Loop) : Refer to service manual of model RG-5300, E (Page 7 ~ 10).

STEP	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
	CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	Refer to Figures 33 and 34	Exactly 98 MHz (54 dB) un modulated.	98 MHz	Adjust for 19 ± 0.1 kHz.	Adjust the semi-variable resister (VR1)

FM Switch (SW101D) : ON
MODE (SW303) : STEREO

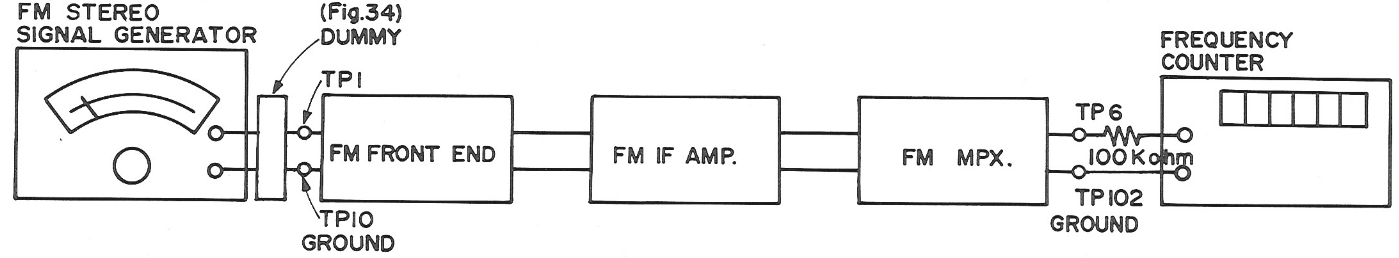

FM STEREO SIGNAL GENERATOR
(Fig.34) DUMMY
TP1
TP10 GROUND
FM FRONT END
FM IF AMP.
FM MPX.
TP6
100 Kohm
TP102 GROUND
FREQUENCY COUNTER

Figure 33 FM MPX ALIGNMENT EQUIPMENT CONNECTION

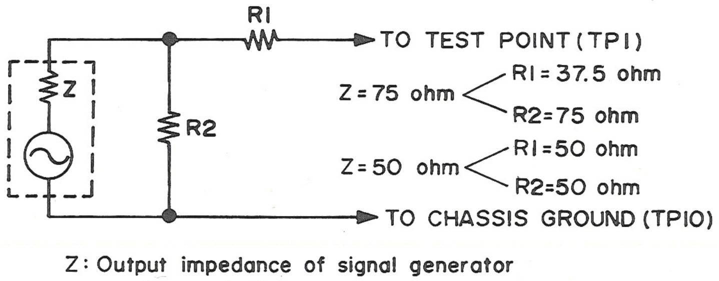

R1
Z
R2
TO TEST POINT (TP1)
Z=75 ohm
R1=37.5 ohm
R2=75 ohm
Z=50 ohm
R1=50 ohm
R2=50 ohm
TO CHASSIS GROUND (TP10)
Z: Output impedance of signal generator

Figure 34 FM DUMMY

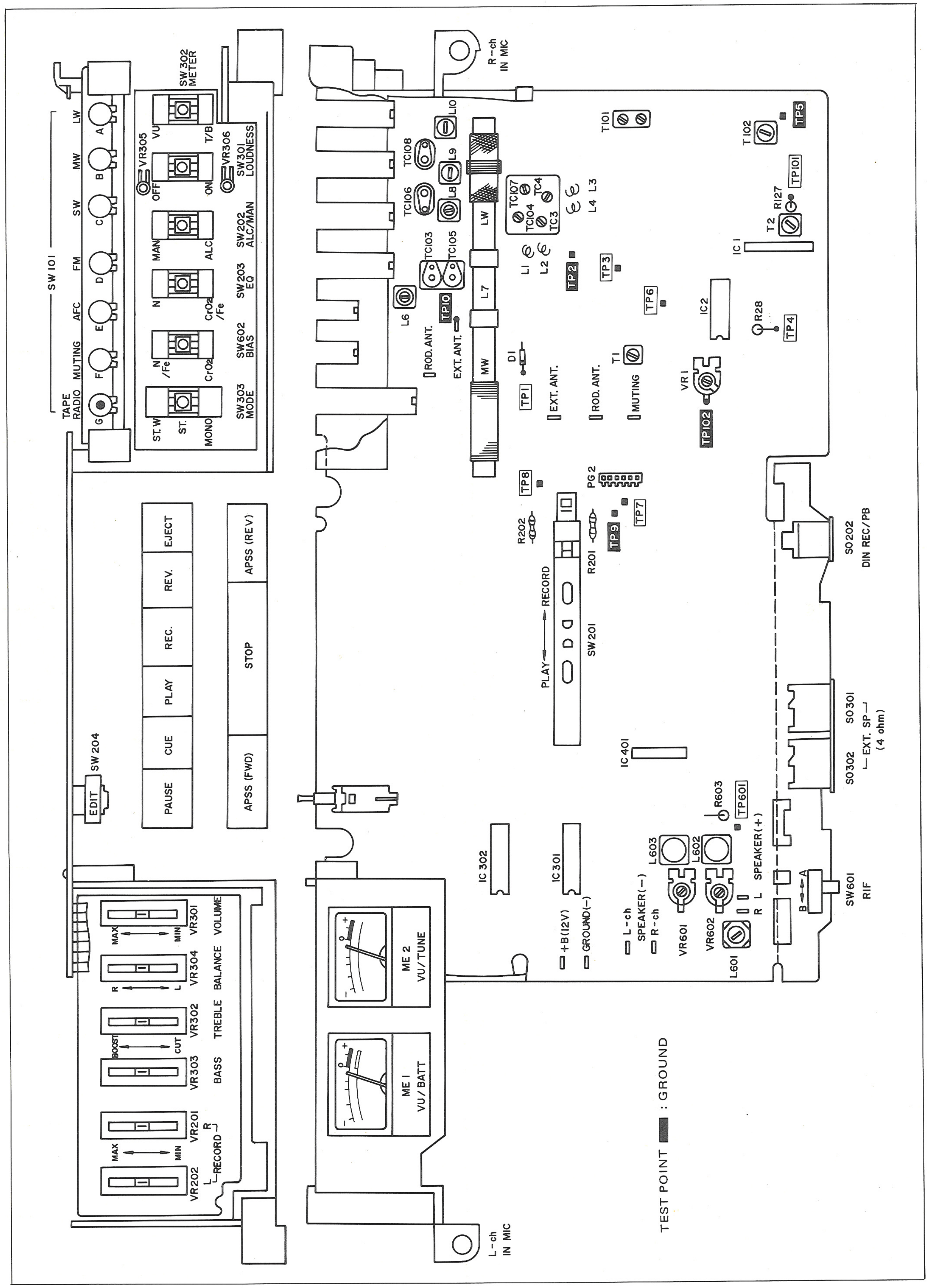
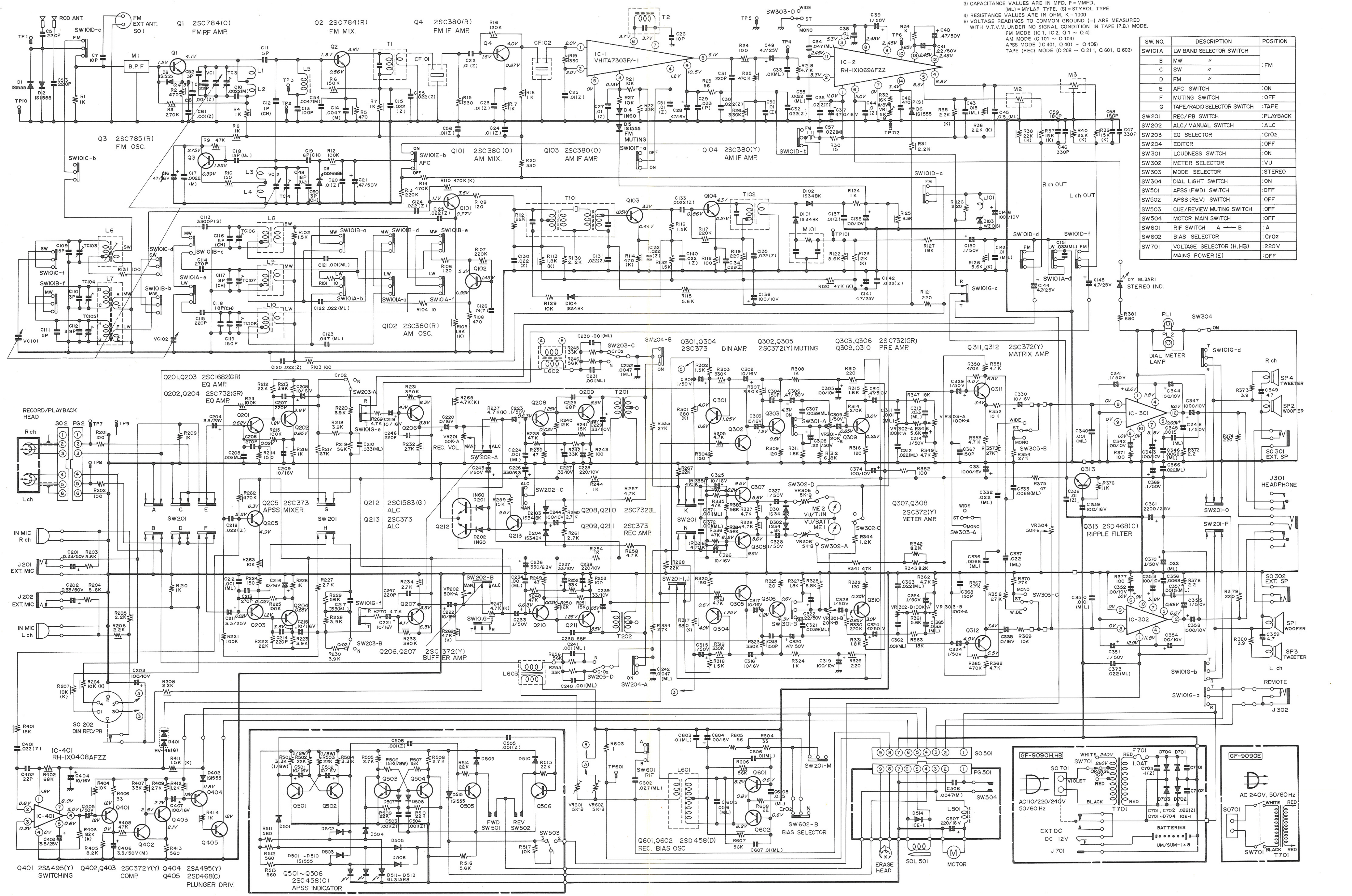

R-ch IN MIC
L-ch IN MIC
SW 101
LW
MW
SW
FM
AFC
MUTING
TAPE RADIO
SW302 METER
VR305
VU
OFF
T/B
ON
VR306
SW301 LOUDNESS
MAN
ALC
SW202 ALC/MAN
N
CrO2 /Fe
SW203 EQ
N /Fe
CrO2
SW602 BIAS
ST. W
ST.
MONO
SW303 MODE
EJECT
REV.
REC.
PLAY
CUE
PAUSE
APSS (REV)
STOP
APSS (FWD)
SW 204
EDIT
VR301 VOLUME
VR304 BALANCE
VR302 TREBLE
VR303 BASS
VR201
VR202
RECORD
MAX
MIN
BOOST
CUT
ME 2 VU/TUNE
ME 1 VU/BATT
TC108
TC106
TC103
TC105
L10
L9
L8
L6
TP10
ROD. ANT.
EXT. ANT.
LW
MW
L7
TC107
TC104
TC4
TC3
L1
L2
L4
L3
TP2
TP3
TP1
D1
EXT. ANT.
ROD. ANT.
T101
T1
MUTING
TP6
IC2
T102
TP5
TP101
R127
T2
IC1
R28
TP4
VR1
TP102
TP8
PG2
TP7
TP9
R202
R201
RECORD
PLAY
SW201
IC401
SO202 DIN REC/PB
SO301
SO302
EXT. SP (4 ohm)
R603
TP601
L603
L602
SPEAKER(+)
SPEAKER(−)
L-ch
R-ch
R
L
B
A
SW601 RIF
IC302
IC301
+B(12V)
GROUND(−)
VR601
VR602
L601
TEST POINT ■ : GROUND

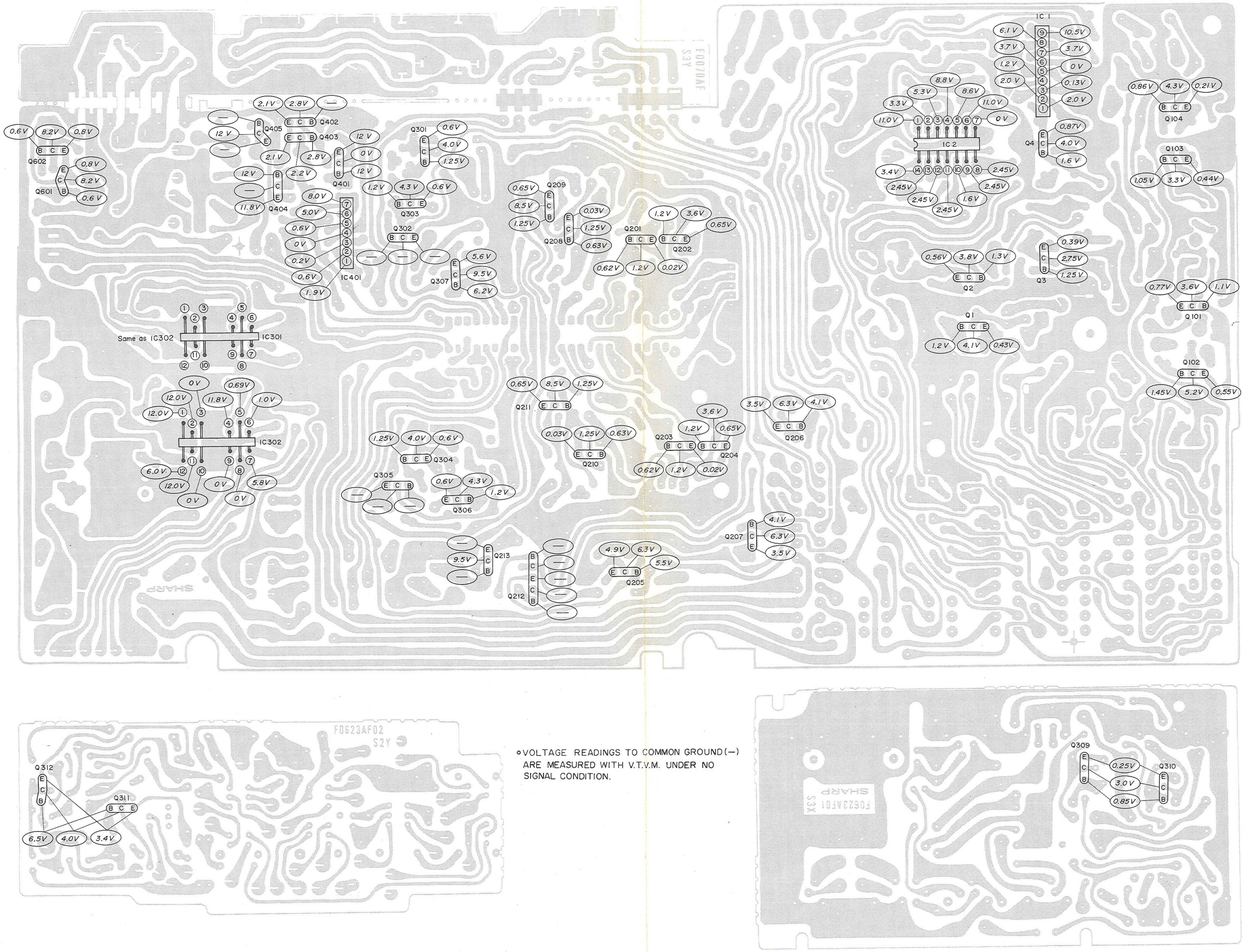
Figure 35 ALIGNMENT POINTS

NOTES
1) FREQ. RANG LW 150 ~ 285 kHz, MW 520 ~ 1620 kHz
SW 5.95 ~ 18 MHz, FM 87.6 ~ 108 MHz
2) I F LW/MW/SW 455 kHz, FM 10.7 MHz
3) CAPACITANCE VALUES ARE IN MFD, P = MMFD.
(ML) = MYLAR TYPE, (S) = STYROL TYPE
4) RESISTANCE VALUES ARE IN OHM, K = 1000
5) VOLTAGE READINGS TO COMMON GROUND (—) ARE MEASURED
WITH V.T.V.M. UNDER NO SIGNAL CONDITION IN TAPE (P.B.) MODE.
FM MODE (IC 1, IC 2, Q 1 ~ Q 4)
AM MODE (Q 101 ~ Q 104)
APSS MODE (IC 401, Q 401 ~ Q 405)
TAPE (REC) MODE (Q 208 ~ Q 211, Q 601, Q 602)

SW. NO.	DESCRIPTION	POSITION
SW101A	LW BAND SELECTOR SWITCH	:FM
B	MW 〃	
C	SW 〃	
D	FM 〃	
E	AFC SWITCH	:ON
F	MUTING SWITCH	:OFF
G	TAPE/RADIO SELECTOR SWITCH	:TAPE
SW201	REC/P.B SWITCH	:PLAYBACK
SW202	ALC/MANUAL SWITCH	:ALC
SW203	EQ SELECTOR	:CrO2
SW204	EDITOR	:OFF
SW301	LOUDNESS SWITCH	:ON
SW302	METER SELECTOR	:VU
SW303	MODE SELECTOR	:STEREO
SW304	DIAL LIGHT SWITCH	:ON
SW501	APSS (FWD) SWITCH	:OFF
SW502	APSS (REV) SWITCH	:OFF
SW503	CUE/REVIEW MUTING SWITCH	:OFF
SW504	MOTOR MAIN SWITCH	:OFF
SW601	RIF SWITCH A ←→ B	: A
SW602	BIAS SELECTOR	:CrO2
SW701	VOLTAGE SELECTOR (H.HB)	:220V
	MAINS POWER (E)	:OFF


ROD ANT.
FM EXT ANT. SO1
Q1 2SC784(O) FM RF AMP.
Q2 2SC784(R) FM MIX.
Q4 2SC380(R) FM IF AMP.
Q3 2SC785(R) FM OSC.
IC-1 VHITA7303P/-1
IC-2 RH-IX1069AFZZ
Q101 2SC380(O) AM MIX.
Q103 2SC380(O) AM IF AMP.
Q104 2SC380(Y) AM IF AMP.
Q102 2SC380(R) AM OSC.
R ch OUT
L ch OUT
D7 GL3AR1 STEREO IND.
DIAL METER LAMP
RECORD/PLAYBACK HEAD
Q201,Q203 2SC1682(GR) EQ AMP.
Q202,Q204 2SC732(GR) EQ AMP.
Q205 2SC373 APSS MIXER
Q212 2SC1583(G) ALC
Q213 2SC373 ALC
Q206,Q207 2SC372(Y) BUFFER AMP.
Q208,Q210 2SC732BL
Q209,Q211 2SC373 REC AMP.
Q301,Q304 2SC373 DIN AMP.
Q302,Q305 2SC372(Y) MUTING
Q303,Q306 2SC732(GR) Q309,Q310 PRE AMP.
Q311,Q312 2SC372(Y) MATRIX AMP.
Q307,Q308 2SC372(Y) METER AMP.
Q313 2SD468(C) RIPPLE FILTER
IC-301
IC-302
SP1 WOOFER
SP2 WOOFER
SP3 TWEETER
SP4 TWEETER
J301 HEADPHONE
SO301 EXT. SP
SO302 EXT. SP
REMOTE
J302
IN MIC R ch
J201 EXT. MIC
J202 EXT. MIC
IN MIC L ch
SO 202 DIN REC/PB
IC-401 RH-IX0408AFZZ
Q401 2SA495(Y) SWITCHING
Q402,Q403 2SC372Y(Y) COMP.
Q404 2SA495(Y) Q405 2SD468(C) PLUNGER DRIV.
Q501~Q506 2SC458(C) APSS INDICATOR
D511~D513 GL31AR8
Q601,Q602 2SD458(D) REC. BIAS OSC
SW602-B BIAS SELECTOR
ERASE HEAD
SOL 501
MOTOR
SO501
PG501
GF-9090H.HB
AC110/220/240V 50/60 Hz
EXT.DC DC 12V
J701
BATTERIES UM/SUM-1×8
T701
GF-9090E
AC 240V, 50/60Hz
SW701

(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.) **Figure 36 SCHEMATIC DIAGRAM**



F0070AF S3Y
SHARP
Q602 B C E 0.6V 8.2V 0.8V
Q601 E C B 0.8V 8.2V 0.6V
Q405 B C E — 12V —
Q402 E C B 2.1V 2.8V —
Q403 E C B 2.1V 2.8V 2.2V
Q401 E C B 12V 0V 12V
Q404 B C E 12V — 11.8V
IC401 ⑦ ⑥ ⑤ ④ ③ ② ① 8.0V 5.0V 0.6V 0V 0.2V 0.6V 1.9V
Q301 E C B 0.6V 4.0V 1.25V
Q303 B C E 1.2V 4.3V 0.6V
Q302 B C E — — —
Q307 E C B 5.6V 9.5V 6.2V
Q209 E C B 0.65V 8.5V 1.25V
Q208 E C B 0.03V 1.25V 0.63V
Q201 B C E Q202 B C E 1.2V 3.6V 0.65V 0.62V 1.2V 0.02V
IC 1 ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ① 6.1V 3.7V 1.2V 2.0V 10.5V 3.7V 0V 0.13V 2.0V
IC 2 ① ② ③ ④ ⑤ ⑥ ⑦ 11.0V 3.3V 5.3V 8.8V 8.6V 11.0V 0V
⑭ ⑬ ⑫ ⑪ ⑩ ⑨ ⑧ 3.4V 2.45V 2.45V 2.45V 1.6V 2.45V 2.45V
Q4 E C B 0.87V 4.0V 1.6V
Q104 B C E 0.86V 4.3V 0.21V
Q103 B C E 1.05V 3.3V 0.44V
Q2 E C B 0.56V 3.8V 1.3V
Q3 E C B 0.39V 2.75V 1.25V
Q101 E C B 0.77V 3.6V 1.1V
Q1 B C E 1.2V 4.1V 0.43V
Q102 B C E 1.45V 5.2V 0.55V
Same as IC302 IC301 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫
IC302 0V 0.69V 12.0V 11.8V 1.0V 12.0V 6.0V 12.0V 0V 0V 5.8V 0V
Q211 E C B 0.65V 8.5V 1.25V
Q210 E C B 0.03V 1.25V 0.63V
Q203 B C E Q204 B C E 3.6V 1.2V 0.65V 0.62V 1.2V 0.02V
Q206 E C B 3.5V 6.3V 4.1V
Q304 B C E 1.25V 4.0V 0.6V
Q305 E C B — — —
Q306 E C B 0.6V 4.3V 1.2V
Q207 B C E 4.1V 6.3V 3.5V
Q213 E C B — 9.5V —
Q212 B C E C B — — — — —
Q205 E C B 4.9V 6.3V 5.5V
F0623AF02 S2Y
Q312 E C B
Q311 B C E
6.5V 4.0V 3.4V
SHARP F0623AF01 S3X
Q309 E C B
Q310 E C B
0.25V 3.0V 0.85V

∘ VOLTAGE READINGS TO COMMON GROUND(−) ARE MEASURED WITH V.T.V.M. UNDER NO SIGNAL CONDITION.

Figure 37 VOLTAGE OF IC AND TRANSISTORS

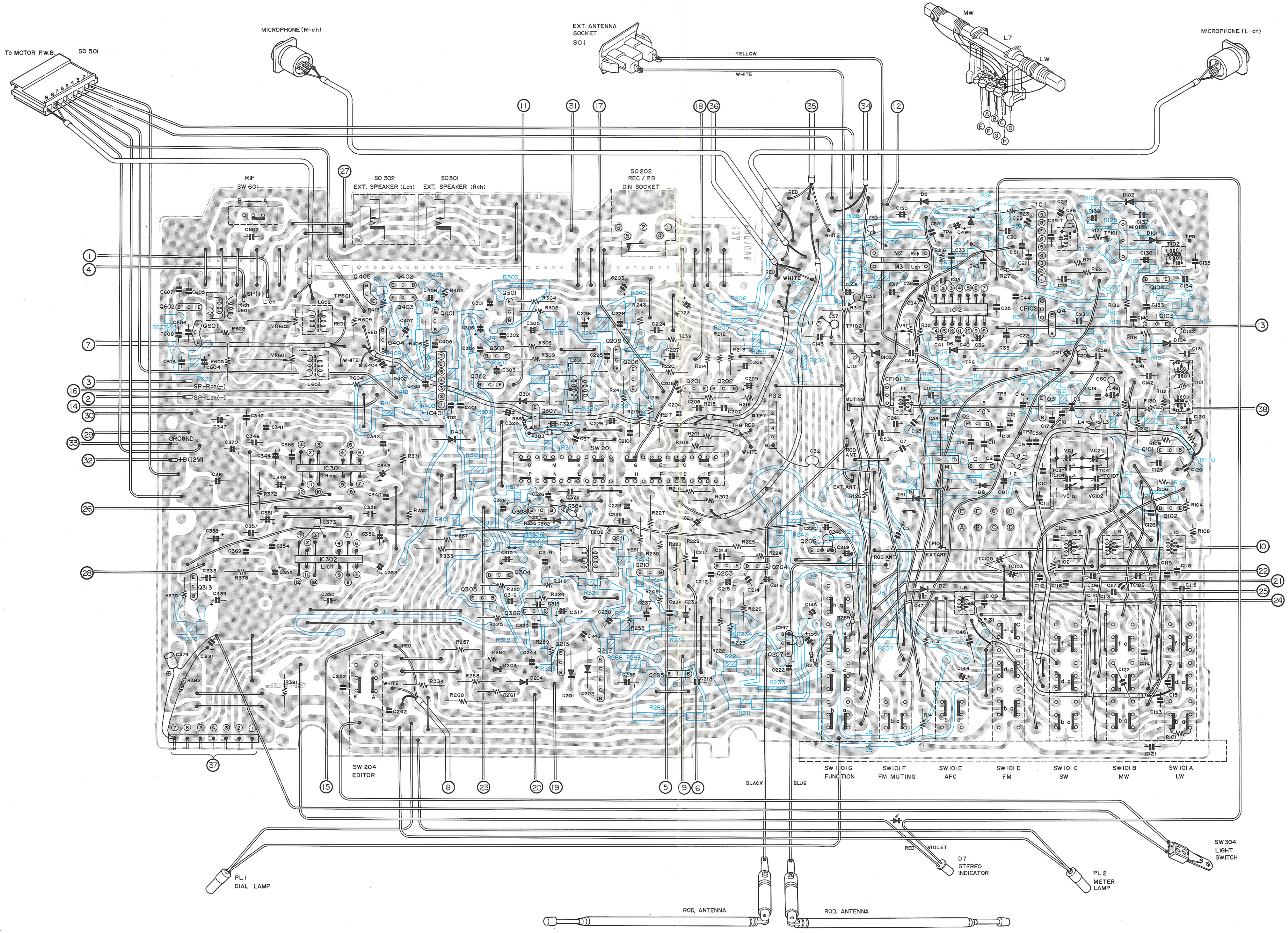

To MOTOR P.W.B.
SO 501
MICROPHONE (R-ch)
EXT. ANTENNA SOCKET
SO1
YELLOW
WHITE
MW
L7
LW
MICROPHONE (L-ch)
RIF SW 601
SO 302 EXT. SPEAKER (Lch)
SO301 EXT. SPEAKER (Rch)
SO 202 REC / P.B DIN SOCKET
SP-Rch(−)
SP-Lch(−)
GROUND
+B (12V)
IC301 Rch
IC302 L ch
IC401
IC1
IC2
SW 201
PG 2
MUTING
ROD ANT.
EXT. ANT.
EXTANT
RED
WHITE
BLACK
BLUE
SW 204 EDITOR
SW 101 G FUNCTION
SW 101 F FM MUTING
SW 101 E AFC
SW 101 D FM
SW 101 C SW
SW 101 B MW
SW 101 A LW
SW 304 LIGHT SWITCH
PL 1 DIAL LAMP
D7 STEREO INDICATOR
VIOLET
PL 2 METER LAMP
ROD. ANTENNA
ROD. ANTENNA

Figure 38 WIRING SIDE OF P. W. BOARD (MAIN)

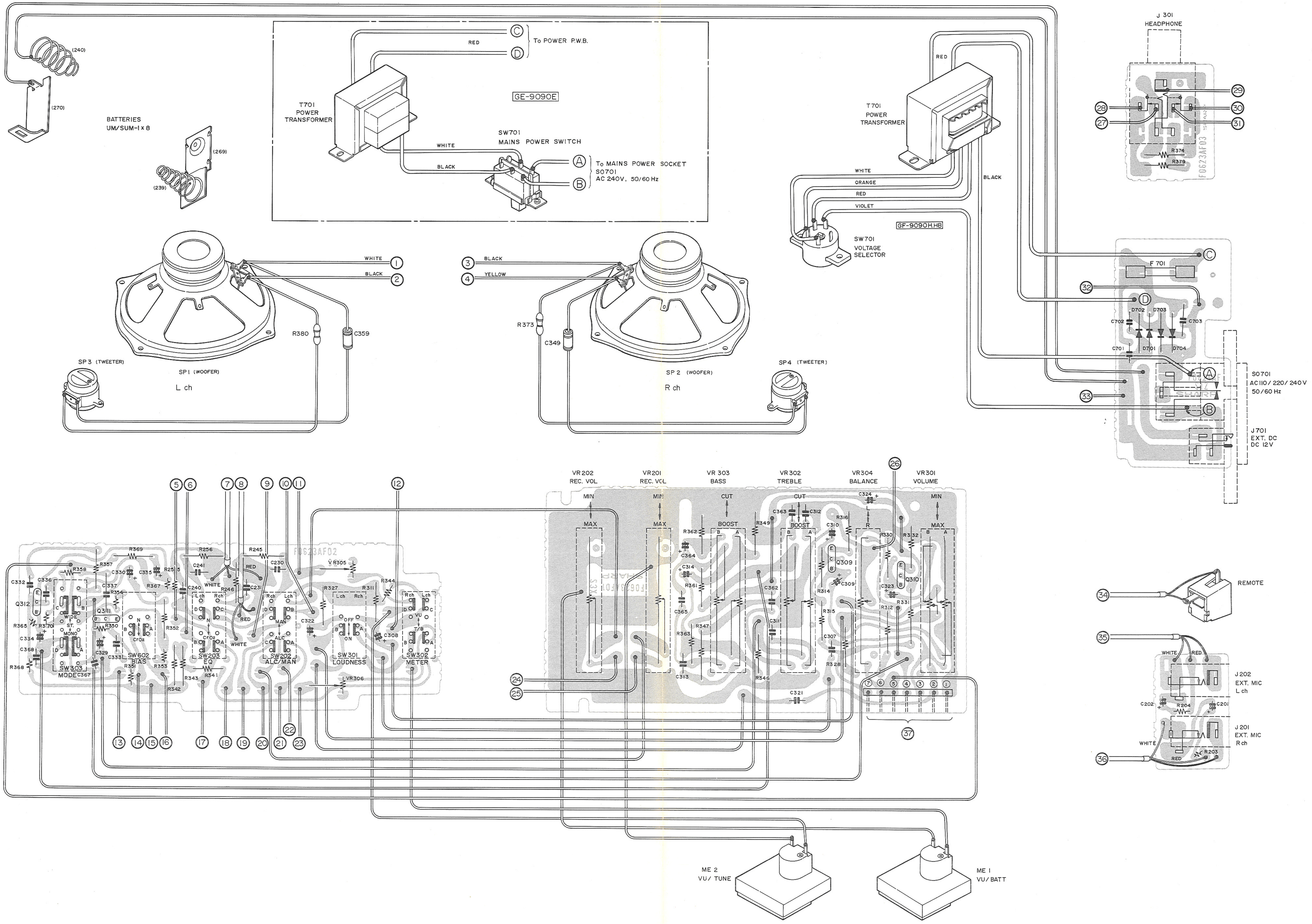

(240)
(270)
BATTERIES
UM/SUM-1 x 8
(269)
(239)
RED
C
D
To POWER P.W.B.
GE-9090E
T701
POWER
TRANSFORMER
SW701
MAINS POWER SWITCH
WHITE
BLACK
A
B
To MAINS POWER SOCKET
SO701
AC 240V, 50/60 Hz
RED
T701
POWER
TRANSFORMER
WHITE
ORANGE
RED
VIOLET
BLACK
GF-9090H,HB
SW701
VOLTAGE
SELECTOR
J 301
HEADPHONE
R374
R379
F0623AF03
WHITE
BLACK
BLACK
YELLOW
R380
C359
R373
C349
SP3 (TWEETER)
SP1 (WOOFER)
L ch
SP2 (WOOFER)
R ch
SP4 (TWEETER)
F 701
D702
D703
C702
C703
C701
D701
D704
SO701
AC110/220/240V
50/60 Hz
J701
EXT. DC
DC 12V
VR202
REC. VOL
VR201
REC. VOL
VR303
BASS
VR302
TREBLE
VR304
BALANCE
VR301
VOLUME
MIN
MAX
CUT
BOOST
L
R
Q309
Q310
Q311
Q312
R369
R256
R245
F0623AF02
VR305
VR306
WHITE
RED
SW303
MODE
WIDE
ST.
MONO
SW602
BIAS
SW203
EQ
SW202
ALC/MAN
SW301
LOUDNESS
OFF
ON
SW302
METER
VU
T/B
Lch
Rch
CrO2
N
MAN
ALC
REMOTE
WHITE
RED
J202
EXT. MIC
L ch
C202
R204
C201
J201
EXT. MIC
R ch
R203
ME 2
VU/ TUNE
ME 1
VU/ BATT
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙ ㉚ ㉛ ㉜ ㉝ ㉞ ㉟ ㊱ ㊲

Figure 39 WIRING SIDE OF P. W. BOARD (VOLUME, SWITCH, HEADPHONE, POWER, JACK)

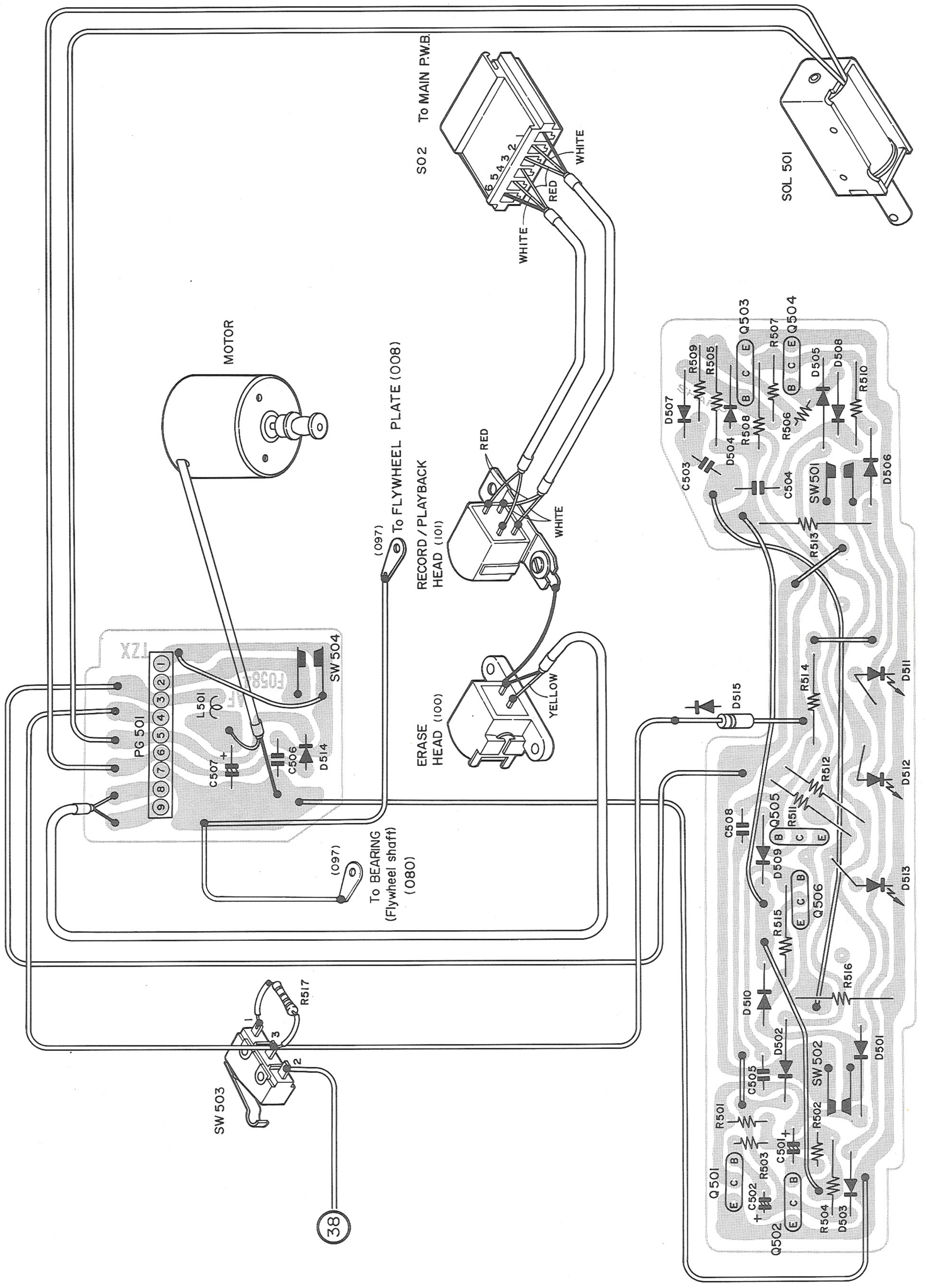

MOTOR
To FLYWHEEL PLATE (008)
(097)
RECORD / PLAYBACK HEAD (101)
ERASE HEAD (100)
RED
WHITE
YELLOW
SO2
To MAIN P.W.B
SOL 501
To BEARING (Flywheel shaft) (080)
(097)
PG 501
L501
C507
C506
D514
SW 504
SW 503
R517
38
D515
Q501
Q502
Q503
Q504
Q505
Q506
C501
C502
C503
C504
C505
C508
D501
D502
D503
D504
D505
D506
D507
D508
D509
D510
D511
D512
D513
R501
R502
R503
R504
R505
R506
R507
R508
R509
R510
R511
R512
R513
R514
R515
R516
SW501
SW502

Figure 40 WIRING SIDE OF P. W. BOARD (APSS, MOTOR)

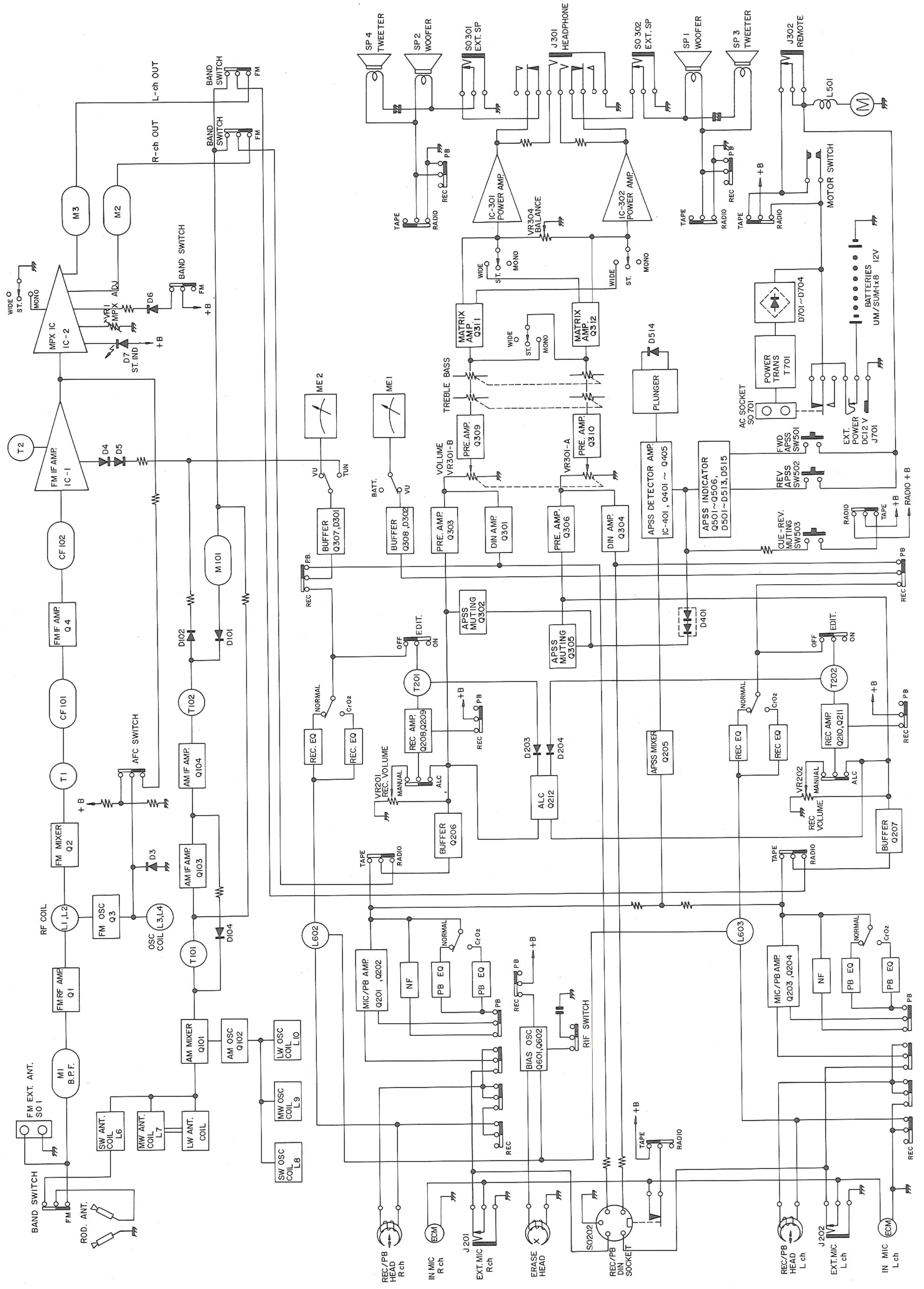

FM EXT. ANT. S01
BAND SWITCH
ROD. ANT.
M1 B.P.F.
FM RF AMP Q1
RF COIL L1, L2
FM OSC Q3
OSC COIL L3, L4
FM MIXER Q2
T1
CF 101
FM IF AMP Q4
CF 102
FM IF AMP IC-1
T2
D4
D5
MPX IC IC-2
VR1 MPX ADJ
D6
D7 ST. IND
WIDE
ST.
MONO
M3
M2
L-ch OUT
R-ch OUT
BAND SWITCH
AFC SWITCH
D3
SW ANT. COIL L6
MW ANT. COIL L7
LW ANT. COIL L8
AM MIXER Q101
AM OSC Q102
LW OSC COIL L10
MW OSC COIL L9
SW OSC COIL L8
T101
D104
AM IF AMP Q103
AM IF AMP Q104
T102
D102
D101
M101
ME 2
ME 1
BATT.
VU
DIN
BUFFER Q307, Q301
BUFFER Q308, Q302
PRE AMP Q303
DIN AMP Q301
PRE AMP Q306
DIN AMP Q304
VOLUME VR301-B
VR301-A
PRE AMP Q309
PRE AMP Q310
TREBLE BASS
MATRIX AMP Q311
MATRIX AMP Q312
IC-301 POWER AMP
IC-302 POWER AMP
VR304 BALANCE
SP 4 TWEETER
SP 2 WOOFER
SO301 EXT. SP
J301 HEADPHONE
SO 302 EXT. SP
SP 1 WOOFER
SP 3 TWEETER
J302 REMOTE
L501
M
MOTOR SWITCH
BATTERIES UM/SUM-1×8 12V
D701~D704
POWER TRANS T701
AC SOCKET SO701
EXT. POWER DC12V J701
FWD APSS SW501
REV APSS SW502
CUE-REV. MUTING SW503
RADIO +B
APSS INDICATOR Q501~Q506, D501~D513, D515
APSS DETECTOR AMP IC-401, Q401~Q405
PLUNGER
D514
D401
APSS MUTING Q302
APSS MUTING Q305
APSS MIXER Q205
EDIT.
OFF
ON
T201
T202
REC AMP Q208, Q209
REC AMP Q210, Q211
REC EQ
NORMAL
CrO2
VR201 REC. VOLUME
VR202 REC. VOLUME
MANUAL
ALC
D203
D204
ALC Q212
BUFFER Q206
BUFFER Q207
L602
L603
MIC/PB AMP Q201, Q202
MIC/PB AMP Q203, Q204
NF
PB EQ
BIAS OSC Q601, Q602
RIF SWITCH
TAPE
RADIO
REC
PB
+B
REC/PB HEAD R ch
IN MIC R ch
J201 EXT. MIC R ch
ERASE HEAD
SO202 REC/PB DIN SOCKET
REC/PB HEAD L ch
J202 EXT. MIC L ch
IN MIC L ch

Figure 41 BLOCK DIAGRAM

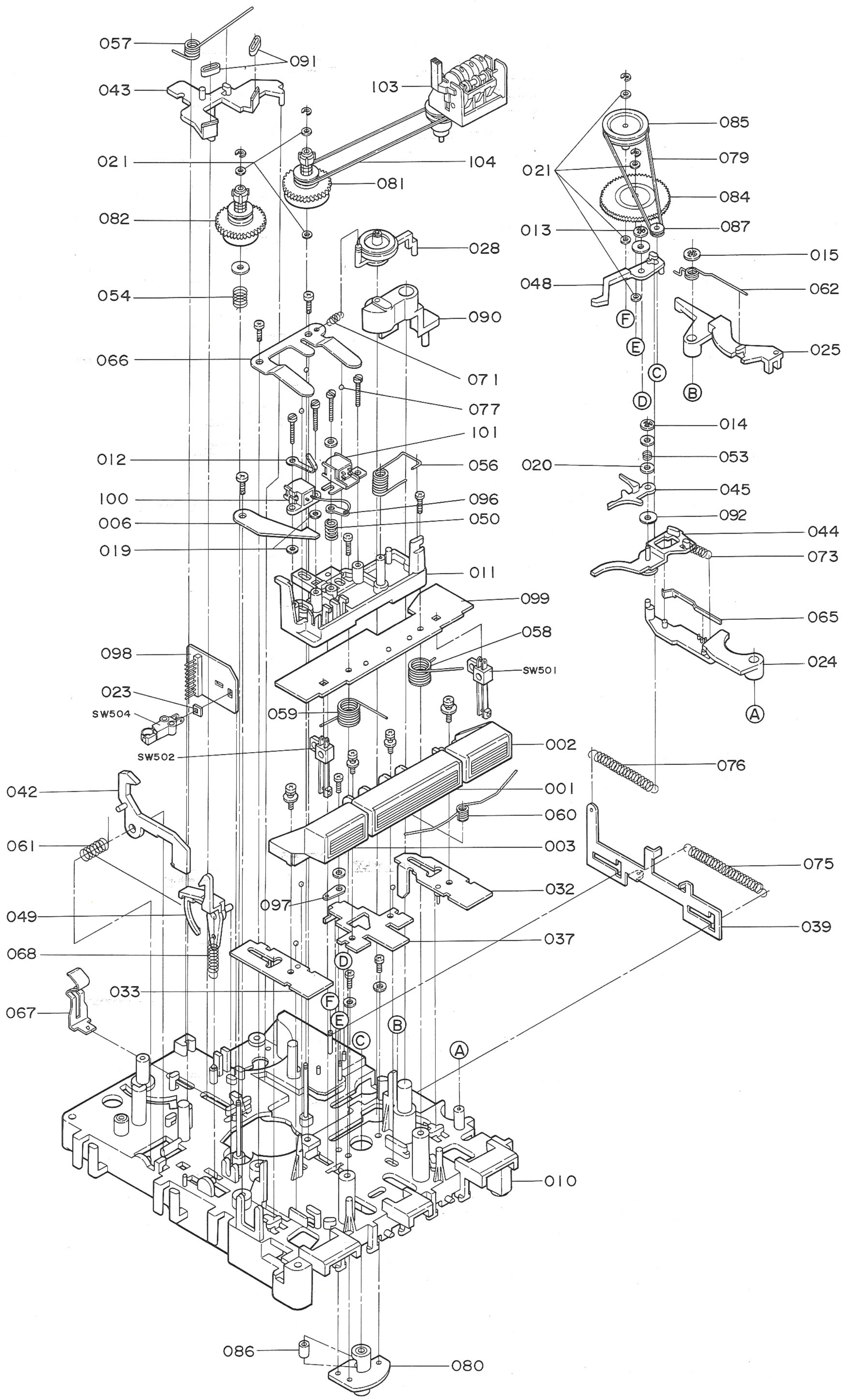

057
091
043
103
021
104
081
082
028
054
090
066
071
077
101
012
056
100
096
006
050
019
011
099
058
SW501
098
023
SW504
059
SW502
002
001
042
060
061
003
032
097
049
037
068
033
D
F
E
C
B
A
067
010
086
080
085
021
079
084
013
087
015
048
062
025
F
E
C
D
B
014
053
020
045
092
044
073
065
024
A
076
075
039

Figure 42 MECHANISM EXPLODED TOP VIEW

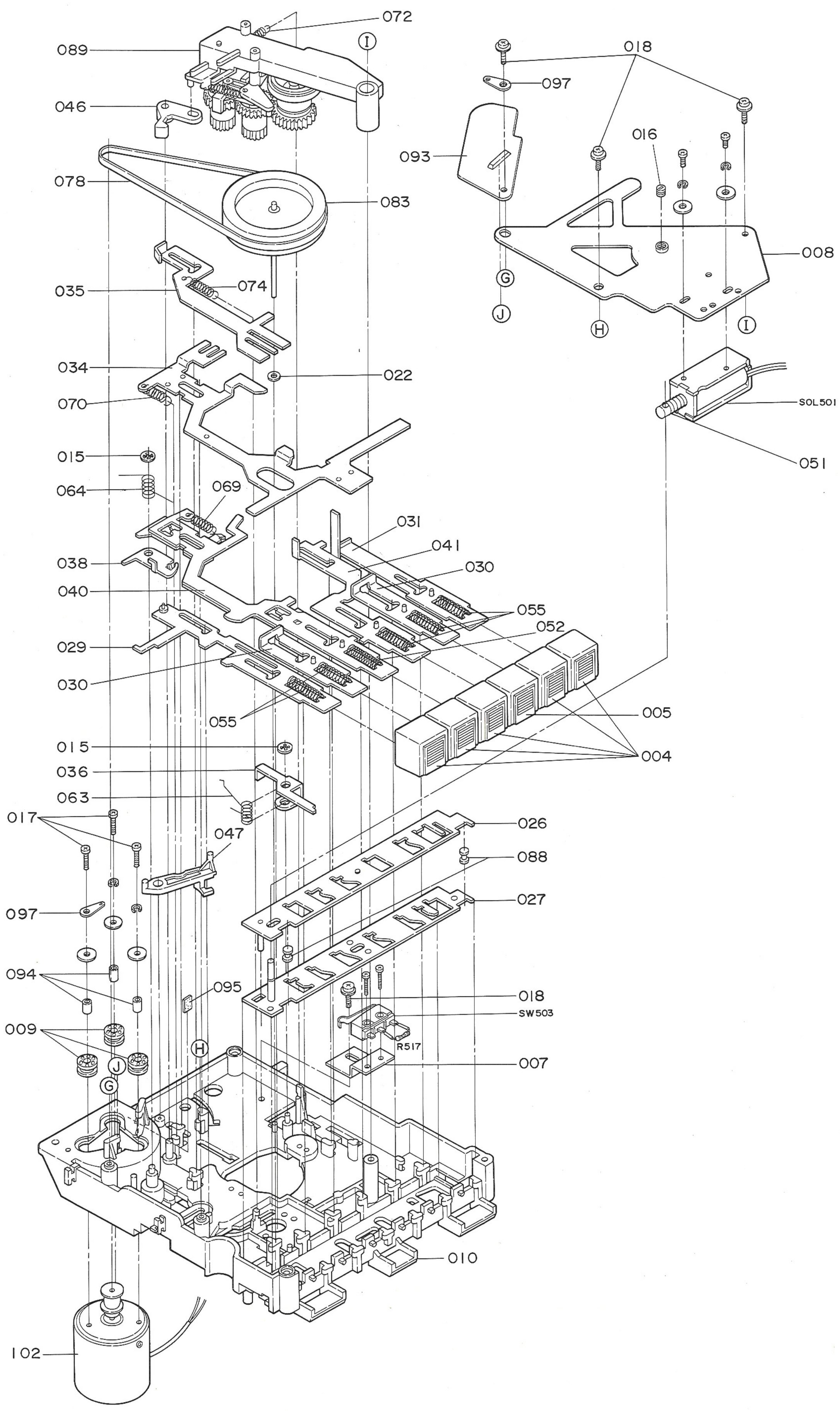

072
089
I
018
097
046
093
016
078
083
008
035
074
G
J
H
I
034
022
070
SOL501
015
051
064
069
031
041
030
038
040
055
052
029
030
005
055
004
015
036
063
017
047
026
088
097
027
094
095
018
SW503
009
R517
007
J
G
H
010
102

Figure 43 MECHANISM EXPLODED BOTTOM VIEW

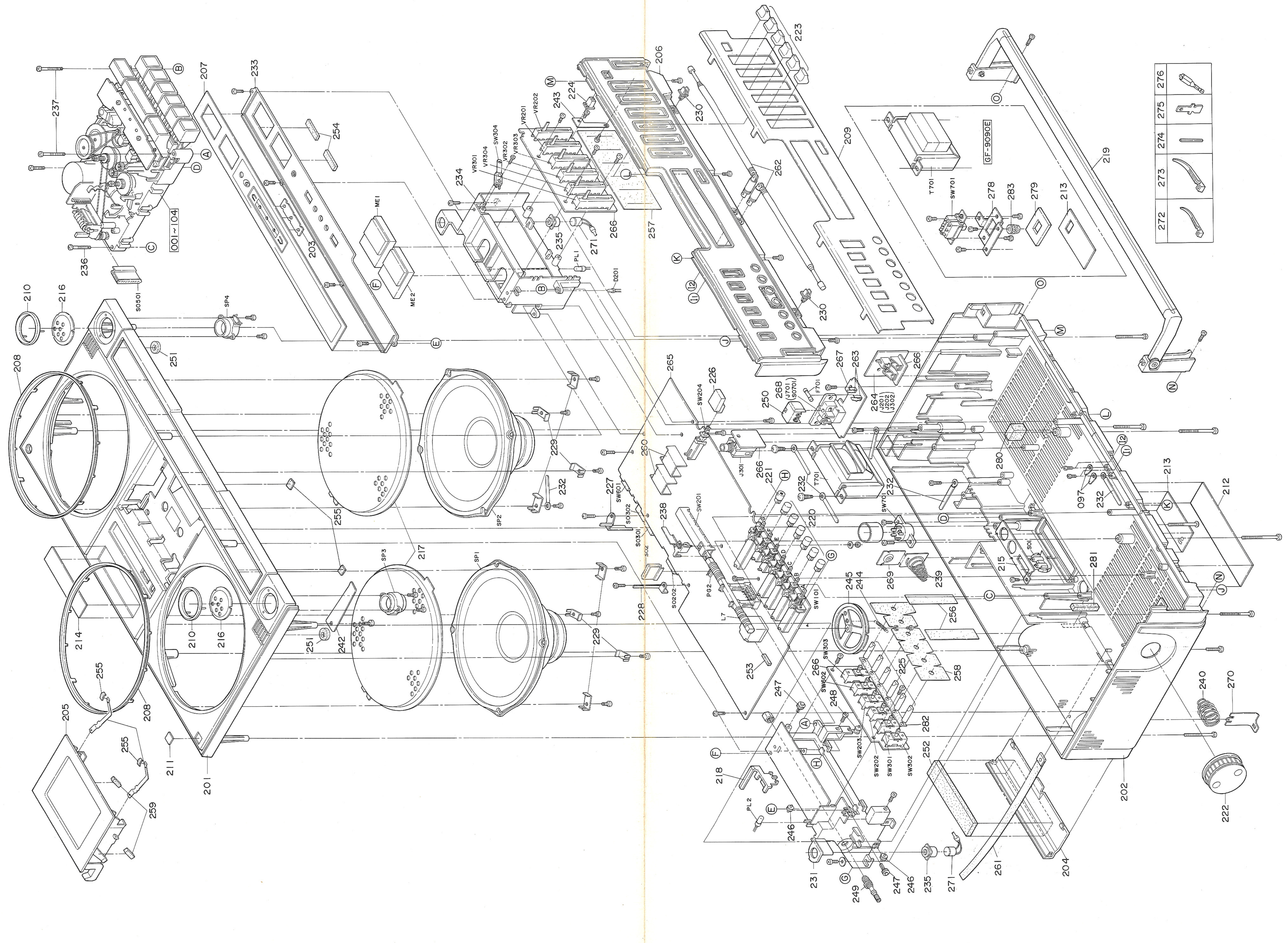

001~104
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
278
279
280
281
282
283
097
GF-9090E
SP1
SP2
SP3
SP4
ME1
ME2
PL1
PL2
D201
SO501
SO1
SO2
SO202
SO301
SO302
VR201
VR202
VR301
VR302
VR303
VR304
SW101
SW201
SW202
SW203
SW204
SW301
SW302
SW303
SW304
SW601
SW602
SW701
T701
J301
J701
S0701
J201
J202
J302
PG2
L7
A
B
C
D
E
F
G
H
J
K
L
M
N
O
⑪
⑫

Figure 44 CABINET EXPLODED VIEW

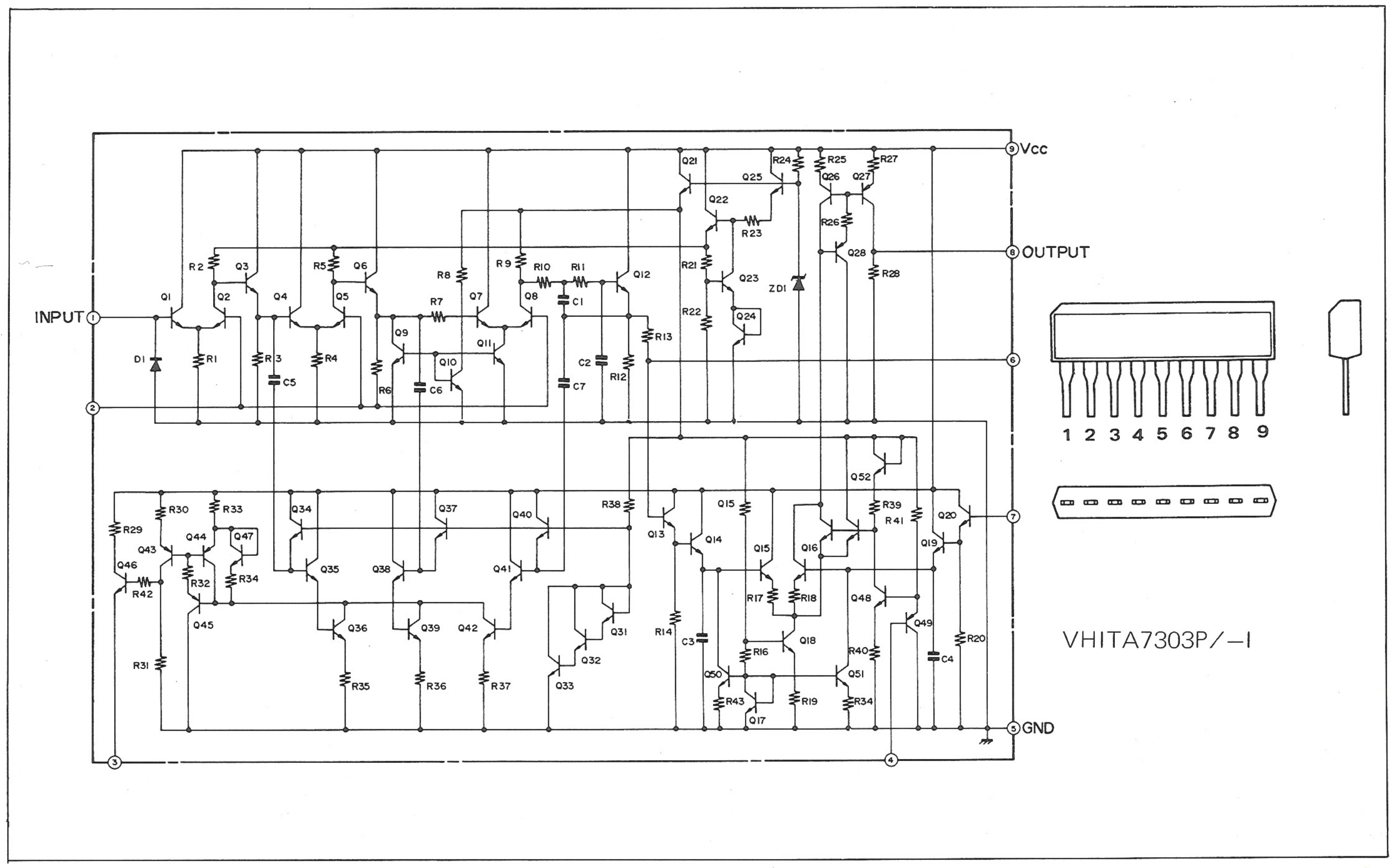

Vcc
OUTPUT
INPUT
GND
VHITA7303P/-I
1 2 3 4 5 6 7 8 9

Figure 45 EQUIVALENT CIRCUIT OF IC (IC 1)

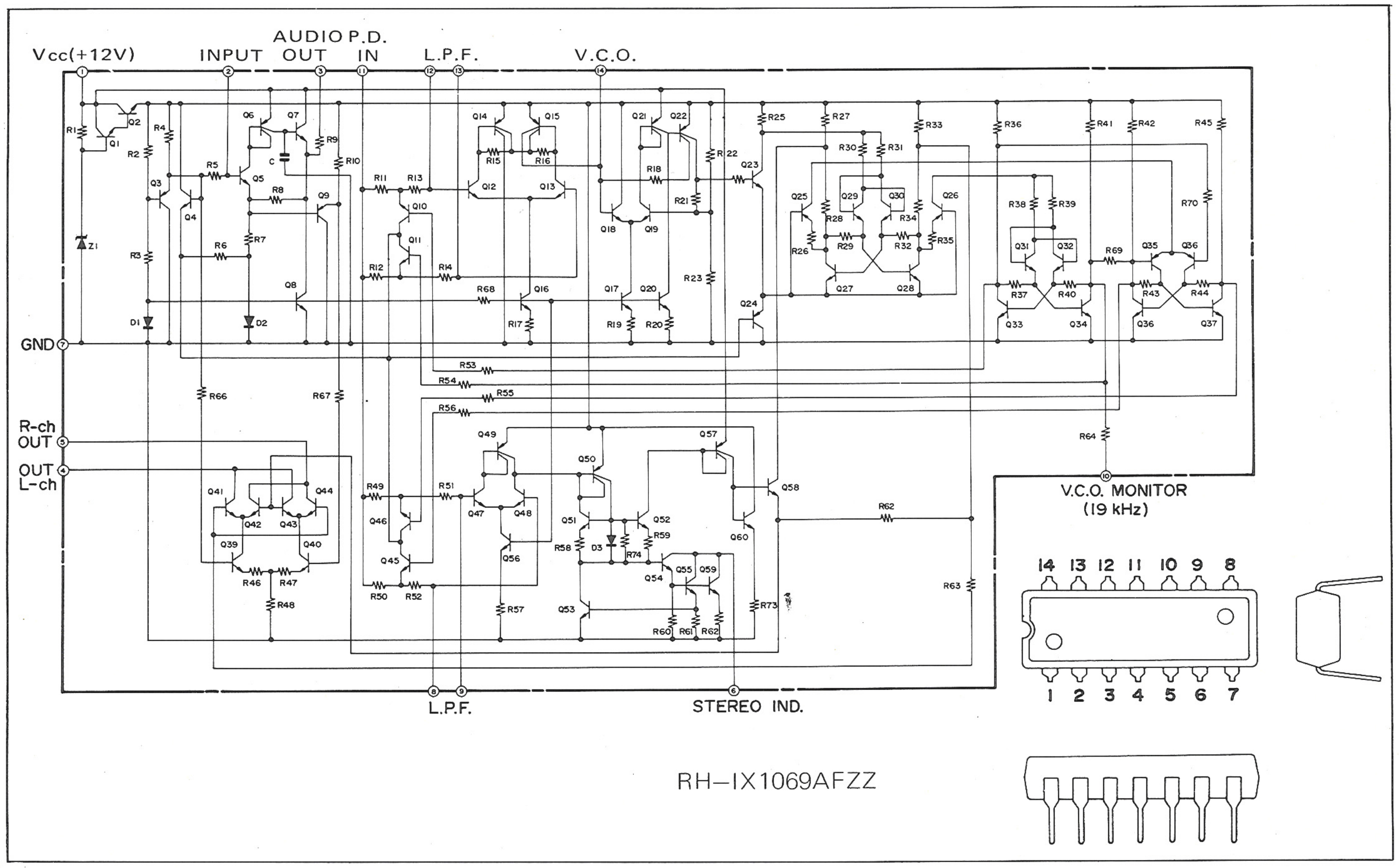

Vcc(+12V)
INPUT
AUDIO P.D.
OUT
IN
L.P.F.
V.C.O.
GND
R-ch OUT
OUT L-ch
V.C.O. MONITOR
(19 kHz)
L.P.F.
STEREO IND.
14 13 12 11 10 9 8
1 2 3 4 5 6 7
RH-IX1069AFZZ

Figure 46 EQUIVALENT CIRCUIT OF IC (IC 2)

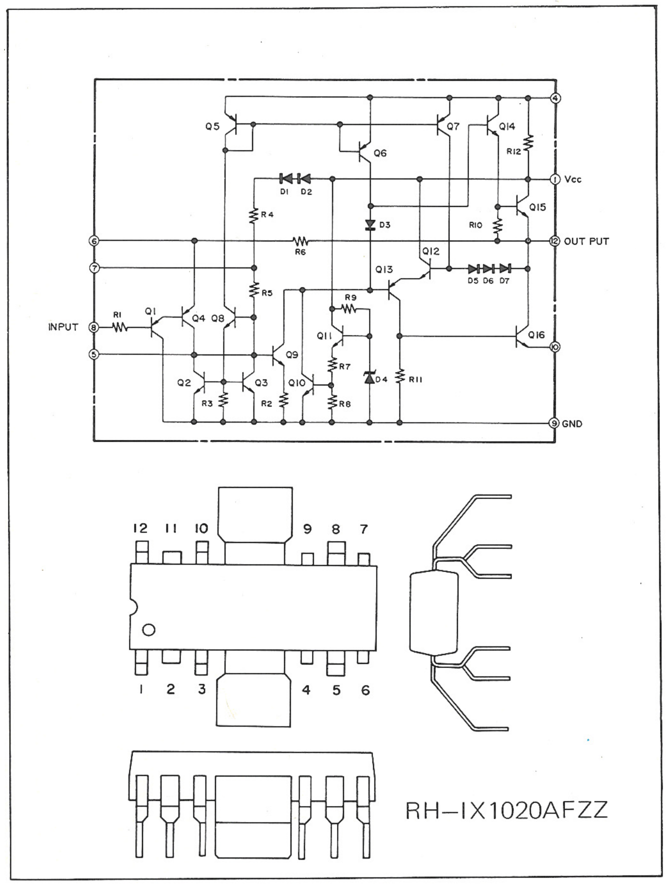

INPUT
Vcc
OUT PUT
GND
12 11 10 9 8 7
1 2 3 4 5 6
RH-IX1020AFZZ

Figure 47 EQUIVALENT CIRCUIT OF IC (IC 301, IC 302)

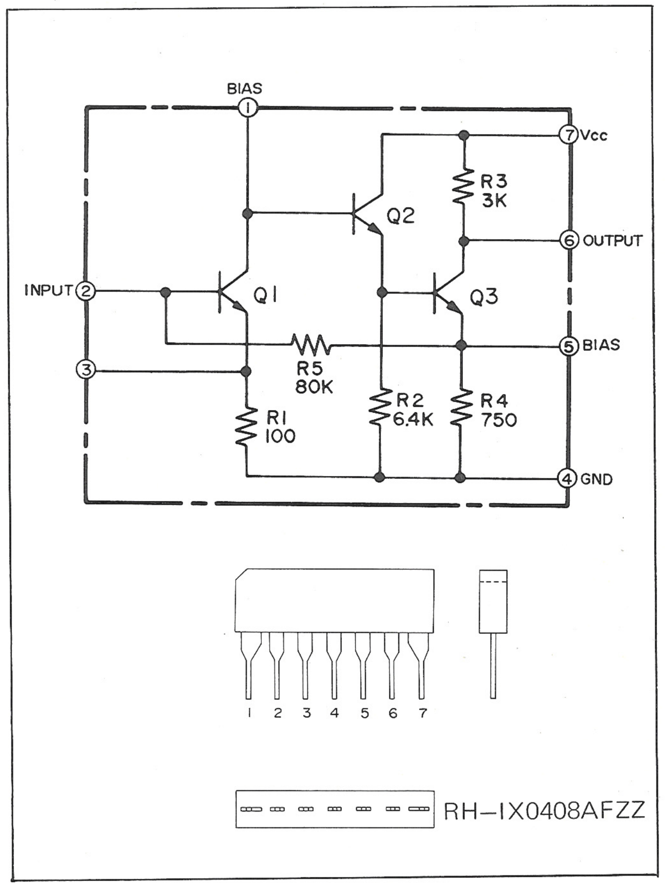

BIAS
①
⑦Vcc
R3
3K
Q2
⑥OUTPUT
INPUT②
Q1
Q3
R5
80K
⑤BIAS
③
R1
100
R2
6.4K
R4
750
④GND
1 2 3 4 5 6 7
RH-IX0408AFZZ

Figure 48 EQUIVALENT CIRCUIT OF IC (IC 401)

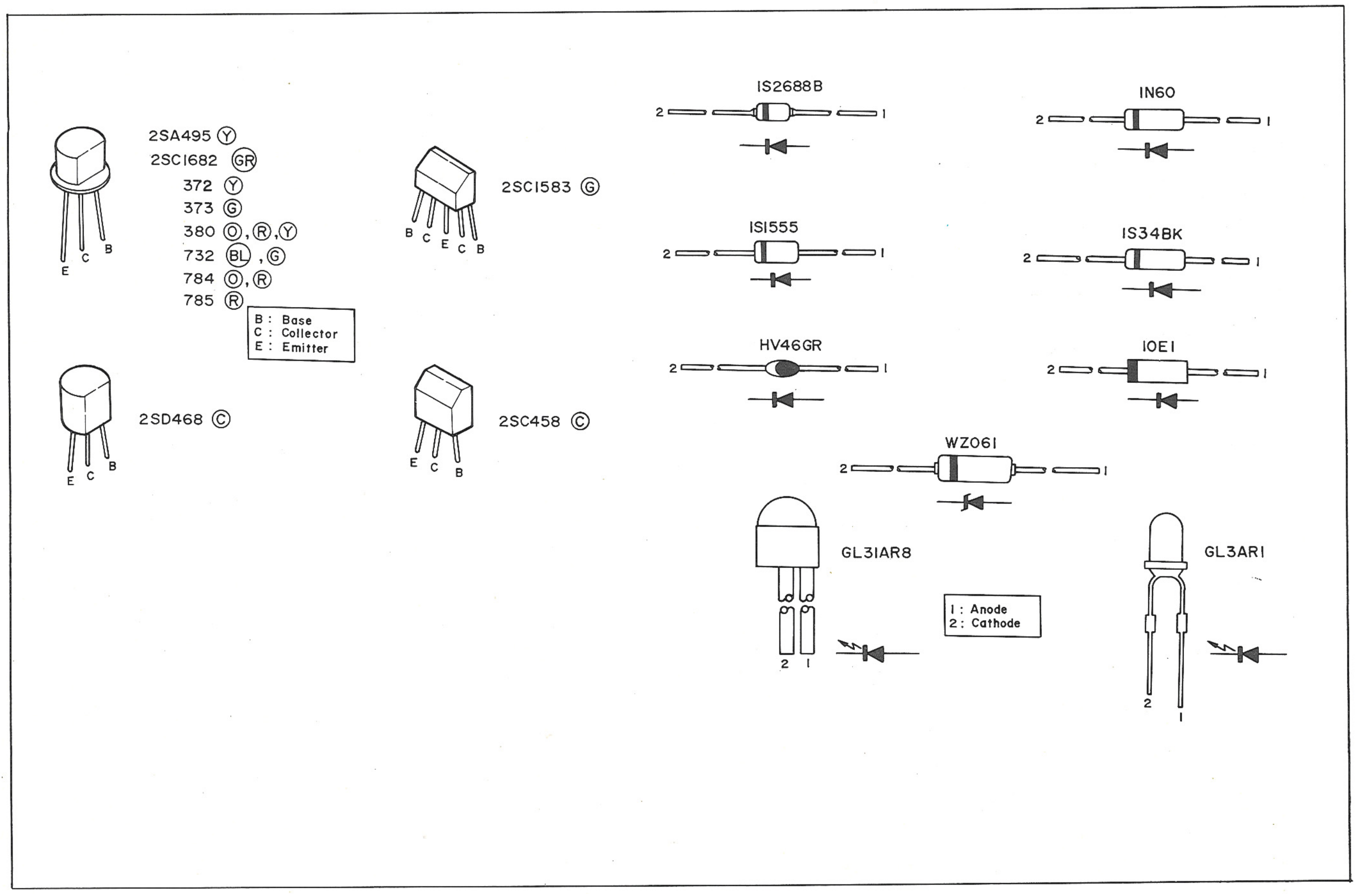

2SA495 Ⓨ
2SC1682 (GR)
372 Ⓨ
373 Ⓖ
380 Ⓞ,Ⓡ,Ⓨ
732 (BL),Ⓖ
784 Ⓞ,Ⓡ
785 Ⓡ
E C B
B : Base
C : Collector
E : Emitter
2SC1583 Ⓖ
B C E C B
2SD468 Ⓒ
2SC458 Ⓒ
IS2688B
IS1555
HV46GR
IN60
IS34BK
10E1
WZ061
GL3IAR8
GL3ARI
1 : Anode
2 : Cathode
2 1

Figure 49 TRANSISTOR, DIODE AND LED

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

INTEGRATED CIRCUITS

REF. NO.	PART NO.	DESCRIPTION	CODE
IC1	VHITA7303P/-1	FM IF Amp. (TA7303P)	AM
IC2	RH-IX1069AFZZ	FM MPX (P.L.L.) (HA1156)	AN
IC301, IC302	RH-IX1020AFZZ	Audio Amp. (TBA810SH)	AN
IC401	RH-IX0408AGZZ	APSS Amp. (TA7120)	AM

TRANSISTORS

REF. NO.	PART NO.	DESCRIPTION	CODE
Q1	VS2SC784-O/-1	FM RF Amp. (2SC784Ⓞ)	AG
Q2	VS2SC784-R/1F	FM Mixer (2SC784Ⓡ)	AG
Q3	VS2SC785-R/-1	FM Oscillator (2SC785Ⓡ))	AF
Q4	VS2SC380-R/-1	FM IF Amp. (2SC380Ⓡ)	AF
Q101	VS2SC380-O/-1	AM Mixer (2SC380Ⓞ)	AF
Q102	VS2SC380-R/-1	AM Oscillator (2SC380Ⓡ)	AF
Q103	VS2SC380-O/-1	AM IF Amp. (2SC380Ⓞ)	AF
Q104	VS2SC380-Y/-1	AM IF Amp. (2SC380Ⓨ)	AF
Q201	VS2SC1682GR-1	Equalizer Amp. (2SC1682(GR))	AD
Q202	VS2SC732-G/-1	Equalizer Amp. (2SC732(GR))	AF
Q203	VS2SC1682GR-1	Equalizer Amp. (2SC1682(GR))	AD
Q204	VS2SC732-G/-1	Equalizer Amp. (2SC732(GR))	AF
Q205	VS2SC373-G/-1	APSS Mixer (2SC373Ⓖ)	AF
Q206, Q207	VS2SC372-Y/-1	Buffer Amp. (2SC372Ⓨ)	AG
Q208	VS2SC732BL/1F	Record Amp. (2SC732(BL))	AD
Q209	VS2SC373-G/-1	Record Amp. (2SC373Ⓖ)	AF
Q210	VS2SC732BL/1F	Record Amp. (2SC732(BL))	AD
Q211	VS2SC373-G/-1	Record Amp. (2SC373Ⓖ)	AF
Q212	VS2SC1583G-1F	ALC Amp. (2SC1583Ⓖ)	AF
Q213	VS2SC373-G/-1	ALC Amp. (2SC373Ⓖ)	AF
Q301	VS2SC373-G/-1	DIN Amp. (2SC373Ⓖ)	AF
Q302	VS2SC372-Y/-1	Muting (2SC372Ⓨ)	AG
Q303	VS2SC732-G/-1	Pre. Amp. (2SC732(GR))	AF
Q304	VS2SC373-G/-1	DIN Amp. (2SC373Ⓖ)	AF
Q305	VS2SC372-Y/-1	Muting (2SC372Ⓨ)	AG
Q306	VS2SC732-G/-1	Pre. Amp. (2SC732(GR))	AF
Q307, Q308	VS2SC372-Y/-1	Meter Amp. (2SC372Ⓨ)	AG
Q309, Q310	VS2SC732-G/-1	Pre. Amp. (2SC732(GR))	AF
Q311, Q312	VS2SC372-Y/-1	Matrix Amp. (2SC372Ⓨ)	AG
Q313	VS2SD468-C/-1	Ripple Filter (2SD468Ⓒ)	AE
C401	VS2SA495-Y/-1	APSS, Switching (2SA495Ⓨ)	AD
Q402, Q403	VS2SC372-Y/-1	APSS, Level Comparison ((2SC372Ⓨ)	AG
Q404	VS2SA495-Y/-1	APSS, Plunger Drive (2SA495Ⓨ)	AD
Q405	VS2SD468-C/-1	APSS Plunger Drive (2SD468Ⓒ)	AE
Q501, Q502	VS2SC458-C/-1	APSS, Indicator Switching (2SC458Ⓒ)	AC
Q503, Q504, Q505, Q506	VS2SC458-C/-1	APSS, Indicator Switching (2SC458Ⓒ)	AC
Q601, Q602	VS2SC458-D/-1	Record Bias Oscillator (2SC458Ⓓ)	AF

DIODES

REF. NO.	PART NO.	DESCRIPTION	CODE
D1, D2	VHD1S1555V/1G	Static Protector (1S1555)	AC
D3	VHC1S2688-B1F	FM AFC (1S2688B)	AE
D4	VHD1N60////-1	Signal Meter Bias (1N60)	AB
D5	VHD1S1555V/1G	Signal Meter Bias (1N60)	AC
D6	VHD1S1555V/1G	MPX. Muting at AM (1S1555)	AC
D7	VHPGL3AR1//-1	LED, STEREO Indicator (GL3AR1)	AD
D8	VHD1S1555V/1G	Static Protector (1S1555)	AC
D101	VHD1S34BK//-1	AM Detector (1S34BK)	
D102	VHD1S34BK//-1	AM Tuning Detector (1S34BK)	
D103	VHEWZ061///-1	Zener, Voltage Stabilizer (WZ061)	AE
D104	VHD1S34BK//-1	AM Overload (1S34BK)	
D201, D202	VHD1N60////-1	ALC (1N60)	AB
D203, D204	VHD1S34BK//-1	ALC (1S34BK)	
D301, D302	VHD1S34BK//-1	VU Meter (1S34BK)	AB
D401	VHVHV46-G//-1	APSS Muting (HV46G)	AD
D402	VHD1S1555V/1G	APSS Muting (1S1555)	AC
D501, D502, D503, D504, D505, D506, D507, D508, D509, D510	VHD1S1555V/1G	APSS Indicator Switching (1S1555)	AC
D511, D512, D513	VHPGL31AR8/-1	LED, APSS Indicator (GL31AR8)	
D514	RH-DX1006AFZZ	Counter Voltage Protector (10E-1)	AC
D515	VHD1S1555V/1G	APSS Indicator Switching (1S1555)	AC
D701, D702, D703, D704	VHD10E1////-1	Rectifier (10E-1)	AC

PARTS LIST

COILS

REF. NO.	PART NO.	DESCRIPTION	CODE
L1, L2	RCILR0112AFZZ	FM RF	AA
L3, L4	RCILR0089AFZZ	FM Oscillator	AA
L5	RCILC0030AFZZ	FM IF Trap	AC
L6	RCILA0255AFZZ	SW Antenna	AE
L7	RCILA0408AFZZ	MW/LW Antenna	AN
L8	RCILB0309AFZZ	SW Oscillator	AE
L9	RCILB0389AFZZ	MW Oscillator	AD
L10	RCILB0353AFZZ	LW Oscillator	AD
L11	RCILF0014AGZZ	Choke	AC
L101	RCILF0014AGZZ	Choke	AC
L501	RCILF0014AGZZ	Choke	AC
L601	RCILB0086AGZZ	Bias Oscillator	AF
L602, L603	RCILB0376AFZZ	Bias Step-up	AE

TRANSFORMERS

REF. NO.	PART NO.	DESCRIPTION	CODE
T1	RCILI0157AFZZ	FM IF	AE
T2	RCILI0208AFZZ	FM IF	AD
T101	RCILI0224AFZZ	AM IF (455kHz)	AH
T102	RCILI0170AFZZ	AM IF	AD
T201, T202	RTRNI0065AFZZ	Recording	AF
T701	RTRNP0504AFZZ RTRNP0509AFZZ	Power (GF-9090H, HB) Power (GF-9090E)	AW

FILTERS

REF. NO.	PART NO.	DESCRIPTION	CODE
CF101, CF102	RFILF0009AFZZ	FM Ceramic Filter (10.7MHz)	AE

PACKAGED CIRCUITS

REF. NO.	PART NO.	DESCRIPTION	CODE
M1	RFILF0056AFZZ	B.P.F. FM ANT.	AE
M2, M3	RMPTA0064AFZZ	MPX. Filter	AE
M101	RMPTA0102AFZZ	Low Pass Filter	AC

CONTROLS

REF. NO.	PART NO.	DESCRIPTION	CODE
VC1, VC2, VC101, VC102, TC3, TC4, TC104, TC107	RVC-R0057AFZZ	Variable Capacitors, Tuning with Trimmers TC3: FM RF Trimmer TC4: FM Oscillation Trimmer TC104: MW Antenna Trimmer TC107: MW Oscillation Trimmer	AQ
TC103, TC105	RTO-H2050AFZZ	Trimmer Assembly TC103: SW Antenna Trimmer TC105: LW Antenna Trimmer	AD
TC106	RTO-H1007AFZZ	SW Oscillation Trimmer	AC
TC108	RTO-H1007AFZZ	LW Oscillation Trimmer	AC
VR1	RVR-M0126AFZZ	5K ohm (B), P.L.L. VCO Adjust	AC
VR201, VR202	RVR-P0062AFZZ	50K ohm (A), RECORD	
VR301 (A, B)	RVR-Q0058AFZZ	20K ohm (B), VOLUME	AH
VR302 (A, B)	RVR-P0061AFZZ	100K ohm (A), TREBLE	
VR303 (A, B)	RVR-P0061AFZZ	100K ohm (A), BASS	
VR304	RVR-Q0059AFZZ	50K ohm (B), BALANCE	
VR305, VR306	RVR-M0003SGZZ	5K ohm (B), Meter Sensitivity Adjust	AC
VR601, VR602	RVR-M0126AFZZ	5K ohm (B), Bias Current Adjust	AC

CAPACITORS

(Unless otherwise specified capacitors are 50V, +80 –20%, Ceramic type.)

REF. NO.	PART NO.	DESCRIPTION	CODE
C5	VCKSPU2GL221M	220PF, 400V (AC), ±20%, Ceramic	
C7	VCCSPU1HL100F	10PF, 50V, ±1PF, Ceramic	
C8	VCKZPU1HF102Z	.001MFD	
C9	VCCSPU1HL220J	22PF, 50V, ±5%, Ceramic	
C10	VCKYPU1HB222M	.0022MFD, 50V, ±20%, Ceramic	
C11	VCCSPU1HL5R0C	5PF, 50V, ±.25PF, Ceramic	
C12	VCCCPU1HH1R0C	1PF, 50V, ±.25PF, Ceramic	
C13	VCCSPU1HL101J	100PF, 50V, ±5%, Ceramic	
C14	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic	
C15	VCKZPU1HF223Z	.022MFD	
C17	VCKYPU1HB222M	.0022MFD, 50V, ±20%, Ceramic	
C18	VCCUPU1HJ150J	15PF, 50V, ±5%, Ceramic	
C19	VCCCPU1HH6R0C	6PF, 50V, ±.25PF, Ceramic	
C20	VCKZPU1HF103Z	.01MFD	
C22, C23, C24, C25,	VCKZPU1HF103Z	.01MFD	
C26	VCCSPU1HL100F	10PF, 50V, ±1PF, Ceramic	
C27	VCKZPU1HF103Z	.01MFD	
C29	VCKZPU1HF333P	.033MFD, 50V, +100 –0%, Ceramic	
C30	VCKZPU1HF223Z	.022MFD	
C31	VCCSPU1HL221J	220PF, 50V, ±5%, Ceramic	
C32	VCKZPU1HF223Z	.022MFD	
C33	VCQYKU1HM103M	.01MFD, 50V, ±20%, Mylar	AB
C34	VCQYKU1HM473M	.047MFD, 50V, ±20%, Mylar	AC
C35	VCQYKU1HM222M	.0022MFD, 50V, ±20%, Mylar	AB
C36	VCKZPU1HF223Z	.022MFD	
C38	VCKZPU1HF103Z	.01MFD	
C42	VCQSMU1HS471J	470PF, 50V, ±5%, Styrol	AB
C43	VCQYKU1HM153M	.015MFD, 50V, ±20%, Mylar	AB
C44	VCKZPU1HF103Z	.01MFD	
C45	VCQYKU1HM153M	.015MFD, 50V, ±20%, Mylar	AB
C46, C47	VCCSPU1HL331J	330PF, 50V, ±5%, Ceramic	
C48	VCCUPU1HJ180J	18PF, 50V, ±5%, Ceramic	
C50, C51	VCKZPU1HF103Z	.01MFD	
C52	VCCSPU1HL3R0C	3PF, 50V, ±.25PF, Ceramic	
C53	VCKSPU2GL221M	220PF, 400V (AC), ±20%, Ceramic	
C54	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic	
C55	VCKZPU1HF223Z	.022MFD	
C56	VCKZPU1HF103Z	.01MFD	
C57	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic	
C58, C59	VCCSPU1HL181J	180PF, 50V, ±5%, Ceramic	
C60	VCCCPU1HH3R0C	3PF, 50V, ±.25PF, Ceramic	
C61	VCKZPU1HF102Z	.001MFD	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C109	VCCSPU1HL5R0C	5PF, 50V, ±.25PF, Ceramic	
C110	VCCSPU1HL3R0C	3PF, 50V, ±.25PF, Ceramic	
C111	VCCSPU1HL5R0C	5PF, 50V, ±.25PF, Ceramic	
C112	VCCSPU1HL390J	39PF, 50V, ±5%, Ceramic	
C113	VCQSMT1HS332J	3300PF, 50V, ±5%, Styrol	AB
C114	VCCSPU1HL271J	270PF, 50V, ±5%, Ceramic	
C115	VCCSPU1HL221J	220PF, 50V, ±5%, Ceramic	
C116	VCCCPU1HH5R0C	5PF, 50V, ±.25PF, Ceramic	
C117	VCCCPU1HH8R0D	8PF, 50V, ±.5PF, Ceramic	
C118	VCCCPU1HH180J	18PF, 50V, ±5%, Ceramic	
C119	VCCSPU1HL151J	150PF, 50V, ±5%, Ceramic	
C120	VCKZPU1HF223Z	.022MFD	
C121	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C122	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C123	VCQYKU1HM473M	.047MFD, 50V, ±20%, Mylar	AC
C124, C125	VCKZPU1HF223Z	.022MFD	
C126	VCKZPU1HF103Z	.01MFD	
C130, C131, C132	VCKZPU1HF223Z	.022MFD	
C133	VCKZPU1HF222Z	.0022MFD	
C134, C135	VCKZPU1HF223Z	.022MFD	
C137	VCKZPU1HF103Z	.01MFD	
C140, C142	VCKZPU1HF223Z	.022MFD	
C143	VCQYKU1HM103M	.01MFD, 50V, ±20%, Mylar	AB
C151	VCQYKU1HM333M	.033MFD, 50V, ±20%, Mylar	AB
C205	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C206	VCCSPU1HL271J	270PF, 50V, ±5%, Ceramic	
C207	VCCSPU1HL221J	220PF, 50V, ±5%, Ceramic	
C210	VCQYKU1HM333K	.033MFD, 50V, ±10%, Mylar	AB
C212	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C213	VCCSPU1HL271J	270PF, 50V, ±5%, Ceramic	
C214	VCCSPU1HL221J	220PF, 50V, ±5%, Ceramic	
C217	VCQYKU1HM333K	.033MFD, 50V, ±10%, Mylar	AB
C218	VCKZPU1HF223Z	.022MFD	
C224	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C225	VCCSPU1HL680J	68PF, 50V, ±5%, Ceramic	
C230, C231	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C232	VCQYKU1HM472K	.0047MFD, 50V, ±10%, Mylar	AB
C234	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C235	VCCSPU1HL680J	68PF, 50V, ±5%, Ceramic	
C240, C241	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C242	VCQYKU1HM472K	.0047MFD, 50V, ±10%, Mylar	AB
C246, C247	VCCSPU1HL221J	220PF, 50V, ±5%, Ceramic	
C304	VCCSPU1HL151J	150PF, 50V, ±5%, Ceramic	
C307	VCQYKU1HM392M	.0039MFD, 50V, ±20%, Mylar	AA
C311	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C312	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C313	VCQYKU1HM333M	.033MFD, 50V, ±20%, Mylar	AB
C318	VCCSPU1HL151J	150PF, 50V, ±5%, Ceramic	
C321	VCQYKU1HM392M	.0039MFD, 50V, ±20%, Mylar	AA
C332	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C333	VCQYKU1HM682M	.0068MFD, 50V, ±20%, Mylar	AB
C336	VCQYKU1HM682M	.0068MFD, 50V, ±20%, Mylar	AB
C337	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C338	VCKZPU1HF103Z	.01MFD	
C340	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C345	VCQYKU1HM152K	.0015MFD, 50V, ±20%, Mylar	AB
C346	VCQYKU1HM682M	.0068MFD, 50V, ±20%, Mylar	AB
C350	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C356	VCQYKU1HM682M	.0068MFD, 50V, ±20%, Mylar	AB
C357	VCQYKU1HM152K	.0015MFD, 50V, ±20%, Mylar	AB
C362	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C363	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C365	VCQYKU1HM333M	.033MFD, 50V, ±20%, Mylar	AB
C366	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C367, C368	VCCSPU1HL151J	150PF, 50V, ±5%, Ceramic	
C371, C372	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C373	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C401	VCKZPU1HF223Z	.022MFD	
C402	VCCSPU1HL220J	22PF, 50V, ±5%, Ceramic	
C503, C504, C505	VCKZPU1HF102Z	.001MFD	
C506	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic	
C508	VCKZPU1HF102Z	.001MFD	
C602	VCQYKU1HM273K	.027MFD, 50V, ±10%, Mylar	AB
C603	VCQYKU1HM103M	.01MFD, 50V, ±20%, Mylar	AB
C605	VCQYKU1HM563K	.056MFD, 50V, ±10%, Mylar	AC
C606, C607	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C608	VCQYKU1HM153M	.015MFD, 50V, ±20%, Mylar	AB
C701, C702	VCKZPU1HF223Z	.022MFD	
C703	VCKZPU1HF104Z	.1MFD	

ELECTROLYTIC CAPACITORS

REF. NO.	PART NO.	DESCRIPTION	CODE
C16	VCEAAU1CW476Y	47MFD, 16V, +50 –10%	AC
C21	VCEALU1HW474M	.47MFD, 50V, ±20%	AB
C28	VCEAAU1CW476Y	47MFD, 16V, +50 –10%	AC
C37	VCEAAU1CW477Y	470MFD, 16V, +50 –10%	AD
C39	VCEAAU1HW105A	1MFD, 50V, +75 –10%	AB
C40	VCEALU1HW474M	.47MFD, 50V, ±20%	AB
C41	VCEALU1HW224M	.22MFD, 50V, ±20%	AB
C49	VCEAAU1EW475A	4.7MFD, 25V, +75 –10%	AB
C136	VCEAAU1AW107Y	100MFD, 10V, +50 –10%	AB
C138	VCEAAU1AW107Y	100MFD, 10V, +50 –10%	AB
C141, C144, C145	VCEAAU1EW475A	4.7MFD, 25V, +75 –10%	AB
C146	VCEAAU1AW107Y	100MFD, 10V, +50 –10%	AB
C150	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C201, C202	VCEALU1HW334M	.33MFD, 50V, ±20%	AB
C203	VCEAAU1AW107Y	100MFD, 10V, +50 –10%	AB
C204	VCEAAU1EW335A	3.3MFD, 25V, +75 –10%	AB
C208, C209	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C211	VCEAAU1EW335A	3.3MFD, 25V, +75 –10%	AB
C215, C216	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C219, C220, C221, C222	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C223	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C226	VCEAAU0JW337Y	330MFD, 6.3V, +50 –10%	AC
C227	VCEAAU1AW336Y	33MFD, 10V, +50 –10%	AB
C228	VCEAAU1AW227Y	220MFD, 10V, +50 –10%	AC
C229	VCEAAU1AW336Y	33MFD, 10V, +50 –10%	AB
C233	VCEALU1HW104M	.1MFD, 50V, ±20%	AB

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C236	VCEAAU0JW337Y	330MFD, 6.3V, +50 −10%	AC
C237	VCEAAU1AW336Y	33MFD, 10V, +50 −10%	AB
C238	VCEAAU1AW227Y	220MFD, 10V, +50 −10%	AC
C239	VCEAAU1AW336Y	33MFD, 10V, +50 −10%	AB
C243	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C244	VCEAAU1AW107Y	100MFD, 10V, +50 −10%	AB
C301	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C302, C303	VCEAAU1CW106Y	10MFD, 16V, +50 −10%	AB
C305	VCEAAU1AW107Y	100MFD, 10V, +50 −10%	AB
C306	VCEALU1HW474M	.47MFD, 50V, ±20%	AB
C308	VCEALU1HW224M	.22MFD, 50V, ±20%	AB
C309	VCEALU1HW105M	1MFD, 50V, ±20%	AD
C310	VCEALU1HW474M	.47MFD, 50V, ±20%,	AB
C314	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C315	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C316, C317	VCEAAU1CW106Y	10MFD, 16V, +50 −10%	AB
C319	VCEAAU1AW107Y	100MFD, 10V, +50 −10%	AB
C320	VCEALU1HW474M	.47MFD, 50V, ±20%	AB
C322	VCEALU1HW224M	.22MFD, 50V, ±20%	AB
C323	VCEALU1HW105M	1MFD, 50V, ±20%	AD
C324	VCEALU1HW474M	.47MFD, 50V, ±20%	AB
C325, C326	VCEAAU1CW106Y	10MFD, 16V, +50 −10%	AB
C327, C328	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C329	VCEALU1HW105M	1MFD, 50V, ±20%	AD
C330	VCEAAU1CW106Y	10MFD, 16V, +50 −10%	AB
C331	VCEAAU1CW108Y	1000MFD, 16V, +50 −10%	AE
C334	VCEALU1HW105M	1MFD, 50V, ±20%	AD
C335	VCEAAU1CW106Y	10MFD, 16V, +50 −10%	AB
C339	VCEAAU1CW107Y	100MFD, 16V, +50 −10%	AC
C341	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C342, C343, C344	VCEAAU1AW107Y	100MFD, 10V, +50 −10%	AB
C347	VCEAAU1AW108Y	1000MFD, 10V, +50 −10%	AD
C348	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C349	VCE9AT1SD475M	4.7MFD, 30V, ±20%	AD
C351	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C352, C353, C354	VCEAAU1AW107Y	100MFD, 10V, +50 −10%	AB
C355	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C358	VCEAAU1AW108Y	1000MFD, 10V, +50 −10%	AD
C359	VCE9AT1SD475M	4.7MFD, 30V, ±20%	AD
C361	VCEAAU1EW228Y	2200MFD, 25V, +50 −10%	AH
C364, C369, C370	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C374	VCEAAU1AW107Y	100MFD, 10V, +50 −10%	AB
C403	VCEAAU1EW335A	3.3MFD, 25V, +75 −10%	AB
C404	VCEAAU1CW106Y	10MFD, 16V, +50 −10%	AB
C405	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C406	VCEALU1HW335M	3.3MFD, 50V, ±20%	AC
C407	VCEAAU1CW107Y	100MFD, 16V, +50 −10%	AC
C501, C502	VCEAAU1CW106Y	10MFD, 16V, +50 −10%	AB
C507	VCEAAU1CW227Y	220MFD, 16V, +50 −10%	AC
C604	VCEAAU1CW107Y	100MFD, 16V, +50 −10%	

REF. NO.	PART NO.	DESCRIPTION	CODE
		RESISTORS	
(Unless otherwise specified resistors are 1/4W, ±5%, Carbon type.)			
R1	VRD-ST2EE102J	1K ohm	
R13	VRD-ST2EE224J	220K ohm	
R14	VRD-ST2EE474J	470K ohm	
R20	VRD-ST2EE331J	330 ohm	
R21	VRD-ST2EE103J	10K ohm	
R22	VRD-ST2EE333J	33K ohm	
R23	VRD-ST2EE560J	56 ohm	
R27	VRD-ST2EE103J	10K ohm	
R28	VRD-ST2EE472J	4.7K ohm	
R30	VRD-ST2EE150J	15 ohm	
R32	VRD-SU2BY163J	16K ohm, 1/8W, ±5%, Carbon	
R101	VRD-ST2EE100J	10 ohm	
R102	VRD-SU2EY152J	1.5K ohm	
R104	VRD-SU2EY100J	10 ohm	
R106	VRD-SU2EY121J	120 ohm	
R108	VRD-SU2EY471J	470 ohm	
R109	VRD-SU2EY121J	120 ohm	
R112	VRD-SU2EY223J	22K ohm	
R116	VRD-ST2EE152J	1.5K ohm	
R121, R126	VRD-ST2EE221J	220 ohm	
R127	VRD-ST2EE183J	18K ohm	
R129	VRD-SU2EY103J	10K ohm	
R130	VRD-SU2EY222J	2.2K ohm	
R131	VRD-ST2EE101J	100 ohm	
R132	VRD-ST2EE152J	1.5K ohm	
R201, R202	VRD-ST2EE101J	100 ohm	
R203, R204	VRD-SU2EY562J	5.6K ohm	
R209, R210	VRD-ST2EE102J	1K ohm	
R212	VRD-ST2EE223J	22K ohm	
R213	VRD-ST2EE392J	3.9K ohm	
R214	VRD-ST2EE151J	150 ohm	
R215	VRD-ST2EE104J	100K ohm	
R216	VRD-ST2EE102J	1K ohm	
R217	VRD-ST2EE272J	2.7K ohm	
R218	VRD-ST2EE392J	3.9K ohm	
R219	VRD-ST2EE563J	56K ohm	
R220	VRD-ST2EE392J	3.9K ohm	
R222	VRD-ST2EE223J	22K ohm	
R223	VRD-ST2EE392J	3.9K ohm	
R224	VRD-ST2EE151J	150 ohm	
R225	VRD-ST2EE104J	100K ohm	
R226	VRD-ST2EE102J	1K ohm	
R227	VRD-ST2EE272J	2.7K ohm	
R228	VRD-ST2EE392J	3.9K ohm	
R229	VRD-ST2EE563J	56K ohm	
R230	VRD-ST2EE392J	3.9K ohm	
R239	VRD-ST2EE470J	47 ohm	
R241	VRD-ST2EE153J	15K ohm	
R243	VRD-ST2EE101J	100 ohm	
R245	VRD-ST2EE333J	33K ohm	
R246	VRD-ST2EE563J	56K ohm	
R249	VRD-ST2EE470J	47 ohm	
R251	VRD-ST2EE153J	15K ohm	
R253	VRD-ST2EE101J	100 ohm	
R255	VRD-ST2EE333J	33K ohm	
R256	VRD-ST2EE563J	56K ohm	
R257, R258	VRD-ST2EE472J	4.7K ohm	
R259	VRD-ST2EE153J	15K ohm	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R260, R261	VRD-ST2EE272J	2.7K ohm	
R267, R268	VRD-ST2EE223J	22K ohm	
R269, R270	VRD-ST2EE472J	4.7K ohm	
R302	VRD-ST2EE152J	1.5K ohm	
R304	VRD-ST2EE151J	150 ohm	
R308	VRD-ST2EE102J	1K ohm	
R309	VRD-ST2EE121J	120 ohm	
R311	VRD-ST2EE182J	1.8K ohm	
R312	VRD-ST2EE682J	6.8K ohm	
R314	VRD-ST2EE274J	270K ohm	
R315	VRD-ST2EE182J	1.8K ohm	
R316	VRD-ST2EE121J	120 ohm	
R318	VRD-ST2EE152J	1.5K ohm	
R320	VRD-ST2EE151J	150 ohm	
R324	VRD-ST2EE102J	1K ohm	
R325	VRD-ST2EE121J	120 ohm	
R327	VRD-ST2EE182J	1.8K ohm	
R328	VRD-ST2EE682J	6.8K ohm	
R330	VRD-ST2EE274J	270K ohm	
R331	VRD-ST2EE182J	1.8K ohm	
R332	VRD-ST2EE121J	120 ohm	
R333, R334	VRD-ST2EE273J	27K ohm	
R335, R336	VRD-ST2EE473J	47K ohm	
R341	VRD-SU2EY473J	47K ohm	
R342, R343	VRD-ST2EE822J	8.2K ohm	
R344	VRD-SU2EY122J	1.2K ohm	
R346	VRD-ST2EE562J	5.6K ohm	
R347	VRD-ST2EE183J	18K ohm	
R349	VRD-ST2EE472J	4.7K ohm	
R350	VRD-SU2EY474J	470K ohm	
R351	VRD-SU2EY472J	4.7K ohm	
R352	VRD-ST2EE103J	10K ohm	
R353	VRD-SU2EY472J	4.7K ohm	
R354	VRD-SU2EY273J	27K ohm	
R357, R358	VRD-ST2EE273J	27K ohm	
R361	VRD-ST2EE562J	5.6K ohm	
R362	VRD-ST2EE472J	4.7K ohm	
R363	VRD-ST2EE183J	18K ohm	
R365	VRD-SU2EY474J	470K ohm	
R367, R368	VRD-SU2EY472J	4.7K ohm	
R369	VRD-ST2EE103J	10K ohm	
R370	VRD-SU2EY273J	27K ohm	
R371	VRD-ST2EE101J	100 ohm	
R372	VRD-ST2EE2R2J	2.2 ohm	
R373	VRD-ST2EE3R9J	3.9 ohm	
R374	VRD-ST2EE221J	220 ohm	
R375	VRD-ST2EE470J	47 ohm	
R377	VRD-ST2EE101J	100 ohm	
R378	VRD-ST2EE2R2J	2.2 ohm	
R379	VRD-ST2EE221J	220 ohm	
R380	VRD-ST2EE3R9J	3.9 ohm	
R381	VRD-ST2EE681J	680 ohm	
R382	VRD-ST2EE101J	100 ohm	
R383, R384	VRD-ST2EE563J	56K ohm	
R405	VRD-ST2EE822J	8.2K ohm	
R406	VRD-ST2EE330J	33 ohm	
R413	VRD-ST2EE561J	560 ohm	
R501	VRD-SU2BY332J	3.3K ohm, 1/8W, ±5%, Carbon	
R502, R503	VRD-SU2BY223J	22K ohm, 1/8W, ±5%, Carbon	
R504	VRD-ST2EE332J	3.3K ohm	
R505	VRD-ST2EE272J	2.7K ohm	
R506	VRD-SU2BY153J	15K ohm, 1/8W, ±5%, Carbon	
R507	VRD-ST2EE153J	15K ohm	
R508	VRD-ST2EE272J	2.7K ohm	
R509, R510	VRD-ST2EE223J	22K ohm	
R511, R512, R513	VRD-ST2EE561J	560 ohm	
R514, R515	VRD-ST2EE223J	22K ohm	
R516	VRD-ST2EE562J	5.6K ohm	
R517	VRD-ST2EY103J	10K ohm	
R603	VRD-SU2EY1R0J	1 ohm	
R604	VRD-ST2EE330J	33 ohm	
R605	VRD-ST2EE560J	56 ohm	
R608	VRD-ST2EE220J	22 ohm	

MECHANICAL PARTS

REF. NO.	PART NO.	DESCRIPTION	CODE
001	JKNBB0055AFSC	Knob, STOP	AG
002	JKNBB0056AFSC	Knob, Forward APSS	AF
003	JKNBB0057AFSC	Knob, Reverse APSS	AF
004	JKNBM0240AFSE	Knob, EJECT/REW/PLAY/F.F/ PAUSE	AE
005	JKNBM0240AFSF	Knob, RECORD	AC
006	LANGF0376AFFW	Plate, Sub Chassis Stopper	AB
007	LANGF0393AFFW	Bracket, Muting Switch	AC
008	LANGT0514AFZZ	Bracket, Flywheel	AF
009	LBSHS0001AG00	Bushing, Motor	AA
010	LCHSM0228AFZZ	Mechanism Chassis Assembly	
011	LCHSS0107AF00	Sub Chassis Assembly	
012	LHLDW3007AGZZ	Holder, Wire	
013	LSTWC2001AFZZ	Stop Washer, 2φ	
014	LSTWC2403AFZZ	Stop Washer, 2.4φ	
015	LSTWC3002AFZZ	Stop Washer, 3φ	
016	LX-BZ0107AGZZ	Screw, Flywheel Thrust Adjust	AB
017	LX-BZ0148AGFD	Screw, Motor	AA
018	LX-HZ0056AFFD	Screw, Flywheel Bracket and Muting Switch	
019	LX-WZ5013AGZZ	Washer, Erase Head	AA
020	LX-WZ5015AGZZ	Washer, Detect Lever	AA
021	LX-WZ5018AGZZ	Washer, Slip Roller and Gear	AA
022	LX-WZ5037AGZZ	Washer, Flywheel	AA
023	LX-WZ7050AFZZ	Spacer, Motor Switch	AA
024	MARMP0001AFZZ	Arm, Auto Stop	AC
025	MARMP0002AFZZ	Arm, Auto Stop Lock Reset	AC
026	MLEVF0547AFZZ	Lever, Main Lock Plate	AD
027	MLEVF0548AFZZ	Lever, APSS Lock Plate	AD
028	MLEVF0549AFZZ	Idler, Take-up	AG
029	MLEVF0550AFFW	Lever, Pause	AD
030	MLEVF0551AFFW	Lever, Fast Forward/Rewind	AD
031	MLEVF0553AFFW	Lever, Eject	AD
032	MLEVF0555AFZZ	Lever, Forward APSS	AD
033	MLEVF0556AFZZ	Lever, Reverse APSS	AD
034	MLEVF0557AFFW	Lever, Fast Forward/Rewind	AE
035	MLEVF0558AFFW	Lever, Fast Forward	AD
036	MLEVF0560AFFW	Lever, Record Mistake Proof	AC
037	MLEVF0564AFFW	Lever, Stop	AC
038	MLEVF0617AFZZ	Lever, Quick Stop	AB
039	MLEVF0618AFZZ	Lever, Pause Mistake Proof	AC
040	MLEVF0643AFZZ	Lever, Play	AG
041	MLEVF0702AFZZ	Lever, Record	AD

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
042	MLEVP0057AF00	Lever, Erase Proof	AC
043	MLEVP0058AFZZ	Lever, Brake	AC
044	MLEVP0060AFZZ	Lever, Auto Stop	AC
045	MLEVP0061AFZZ	Lever, Tape End Detect	AB
046	MLEVP0062AFZZ	Lever, Fast Forward	AB
047	MLEVP0063AFZZ	Lever, Sub Chassis Return	AC
048	MLEVP0076AFZZ	Lever, Pause Mistake Proof	AC
049	MLEVP0077AFZZ	Lever, Cassette Lock	AC
050	MSPRC0031AGMN	Spring, REC/P.B. Head Adjust	AA
051	MSPRC0109AFFJ	Spring, Plunger	AA
052	MSPRC0110AFFJ	Spring, Play Lever	AA
053	MSPRC0111AFFJ	Spring, Detect Lever	AA
054	MSPRC0115AFFJ	Spring, Supply Turntable	AA
055	MSPRC0139AFFJ	Spring, EJECT/REW/REC/F.F/PAUSE	AA
056	MSPRD0107AFFJ	Spring, Pinch Roller Assembly	AB
057	MSPRD0108AFFJ	Spring, Brake Lever	AA
058	MSPRD0109AFFJ	Spring, Forward APSS Lever	AA
059	MSPRD0110AFFJ	Spring, Reverse APSS Lever	AA
060	MSPRD0111AFFJ	Spring, Stop Lever	AB
061	MSPRD0112AFFJ	Spring, Erase Proof Lever	AA
062	MSPRD0116AFFJ	Spring, Auto Stop Lock Reset Arm	AB
063	MSPRD0117AFFJ	Spring, Record Mistake Proof	AA
064	MSPRD0137AFFJ	Spring, Quick Stop Lever	AA
065	MSPRP0113AFFJ	Spring (Plate type), Auto Stop Arm	AB
066	MSPRP0115AFFW	Spring (Plate type), Sub Chassis Stopper	AC
067	MSPRP0133AFFW	Spring (Plate type), Cassette Retaining	AC
068	MSPRT0151AGFJ	Spring, Cassette Lock Lever	AA
069	MSPRT0330AFFJ	Spring, Play Lever	AA
070	MSPRT0331AFFJ	Spring, Fast Forward/Rewind Lever	AA
071	MSPRT0332AFFJ	Spring, Idler	AA
072	MSPRT0333AFFJ	Spring, Roller Assembly	AA
073	MSPRT0334AFFJ	Spring, Auto Stop Lever	AA
074	MSPRT0335AFFJ	Spring, Fast Forward/Rewind Lever	AA
075	MSPRT0389AFFJ	Spring, Pause Mistake Proof Lever	AA
076	MSPRT0390AFFJ	Spring, Pause Mistake Proof Lever	AB
077	NBALS0004AGFJ	Ball 3ϕ	AA
078	NBLTH0051AF00	Belt, Motor	AD
079	NBLTK0053AF00	Belt, Auto Stop	AC
080	NBRGC0054AFZZ	Bearing, Flywheel Shaft	AG
081	NDAIR0110AFSA	Turntable, Take-up	
082	NDAIR0111AFSA	Turntable, Supply	
083	NFLYC0053AFZZ	Flywheel	AH
084	NGERH0050AFZZ	Gear, Slip Roller	AC
085	NGERP0050AFZZ	Slip Roller	AC
086	NPLYR0050AFZZ	Pulley, Take-up	AB
087	NPLYR0052AFZZ	Pulley, Auto Stop	AB
088	NROLM0051AFFW	Roller, Lock Plate	AA
089	NROLV0004AFZZ	Roller Assembly	AQ
090	NROLY0004AFZZ	Pinch Roller Assembly	AF
091	PCUSG0026AG00	Rubber, Brake Lever	AB
092	PFLT-0313AF00	Washer (Felt), Detect Lever	AA
093	PSLDM3124AFZZ	Shield, Motor Noise	AB
094	PSPAA0001AGFJ	Spacer, Motor Bushing	AB
095	PZETF0123AFZZ	Stopper	AA
096	QHWS-2222AGFN	Lug Terminal, Ground	
097	QHWS-3001AGFN	Lug Terminal, Ground	
098	QPWBF0584AFZZ	P.W. Board, Motor	
099	QPWBF0625AFZZ	P.W. Board, APSS Indicator	
100	RHEDA0059AFZZ	Head, Erase	AK
101	RHEDH0052AFZZ	Head, Record/Play Back	AW
102	RMOTM0067AFZZ	Motor with Pulley	AX
103	KCOUB0061AFZZ	Counter	
104	NBLTK0105AFZZ	Belt, Counter	AC

MISCELLANEOUS

REF. NO.	PART NO.	DESCRIPTION	CODE
201	GCABA1451AFSA	Cabinet, Front (GF-9090H, HB)	
	GCABA1452AFSA	Cabinet, Front (GF-9090E)	
202	GCABB1438AFSA	Cabinet, Back	AY
203	GCOVA1083AFSA	Cover, APSS Indicator (LED)	AB
204	GFTAB1104AFSA	Lid, Battery Compartment	AE
205	GFTAC1069AFSA	Holder, Cassette	AM
206	GWAKP9003AFSA	Cabinet, Operation Plate	AR
207	HDALM0179AFSA	Plate, Dial Scale	AK
208	HDECA0275AFSA	Decoration Ring, Woofer	AS
209	HDECA0276AFSA	Plate, Operation	AU
210	HDECB0064AFSA	Decoration Ring, Tweeter	AG
211	HINDM1133AFSB	Indication Metal, SHARP	AA
212	HINDM1153AFSA	Indication Metal, Model Spec. (GF-9090H, HB)	AD
	HINDM1160AFSA	Indication Metal, Model Spec. (GF-9090E)	AD
213	HINDM1154AFSA	Indication Metal, Voltage Selector Switch (GF-9090H)	AC
	HINDM1161AFSA	Indication Metal, Main Switch (GF-9090E)	AC
214	HINDM1155AFSA	Indication Metal, Model	AD
215	HINDM1156AFSA	Indication Metal, EXT. SP./EXT. ANT.	AD
216	HPNC-0106AFSA	Punching Metal, Tweeter	AE
217	HPNC-0107AFSA	Punching Metal, Woofer	AL
218	HSSND0233AFSA	Pointer, Dial Scale	AD
219	JHNDG1055AFSA	Handle	AX
220	JKNBM0249AFSA	Knob, Push Switch (BAND, AFC, MUTING)	AE
221	JKNBM0253AFSA	Knob, Push Switch (TAPE/RADIO)	AF
222	JKNBN0309AFSA	Knob, Tuning	AC
223	JKNBP0073AFSA	Knob, VOLUME/BALANCE/TREBLE/BASS/RECORD	AE
224	JKNBZ0108AFSA	Knob, LIGHT	AB
225	JKNBZ0109AFSA	Knob, MODE/TAPE Selector/ALC/LOUDNESS/METER	AB
226	JKNBZ0127AFSB	Knob, EDIT	AF
227	LANGK0183AFFW	Bracket, Main P.W. Board Retaining	AB
228	LANGQ0511AFFW	Bracket, Main P.W. Board Retaining	AB
229	LANGS0014AGFP	Bracket, Speaker Retaining	AA
230	LHLDA1052AFSA	Holder, Rod Antenna	AA
231	LHLDF1203AFZZ	Bracket, Switch P.W. Board	AK
232	LHLDW9003CEZZ	Holder, Wire	AA
233	LHLDZ1066AFSB	Holder, Dial Scale Plate	AG
234	LHLDZ1067AFZZ	Bracket, Volume P.W. Board	AK
235	LHLDZ8060AFZZ	Holder, Built-in Microphone	AB
236	LX-HZ0057AFFD	Screw, Mechanism Block Retaining	
237	LX-HZ0058AFFD	Screw, Mechanism Block Retaining	
238	MLEVF0701AFZZ	Lever, REC/PB Switch	AE

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
239	MSPRC0021AFFN	Spring, Battery (–)	AA
240	MSPRC0140AFFN	Spring, Battery (–)	AB
241	MSPRP0089AGFW	Spring (Plate type), Cassette Holder	AB
242	MSPRP0132AFFW	Spring (Plate type), Cassette Holder	AC
243	MSPRP0154AFZZ	Spring (Plate type), Light Knob	AC
244	MSPRT0003AGFW	Spring, Dial Cord	AA
245	NDRM-0046AFZZ	Drum, Dial Cord	AC
246	NPLYB0050AFZZ	Pulley, Dial Cord	AA
247	NPLYB0051AFZZ	Pulley, Dial Cord	AA
248	NPLYC0102AFFW	Pulley, Dial Cord	AB
249	NSFTD0166AFFW	Shaft, Dial Cord	AE
250	PCOVW1100AFZZ	Cover, AC Socket	AD
251	PCUSG0076AF00	Cushion, Built-in Microphone	AA
252	PCUSU0092AG00	Cushion, Battery Lid	AA
253	PCUSU0128AFZZ	Cushion, Coil (L3, L4)	AA
254	PCUSU0154AF08	Cushion, Meter	AA
255	PFLT-0095AG00	Felt, Cassette Holder	AA
256	PFLT-0127AF00	Felt, Battery Compartment	AA
257	PFLT-0307AF00	Felt, Volume Cover	AA
258	PFLT-0311AF00	Felt, Switch Cover	AE
259	PGUMM0115AF00	Cushion Rubber, Cassette Holder	AA
260	PRDAR0127AFFW	Heatsink, Power IC	AB
261	PTPEC0005AG00	Ribbon, Battery Removal	
262	QANTR0105AFZZ	Rod Antenna	AP
263	QFSHD1001AGZZ	Holder, Fuse	AB
264	QJAKG0051AFZZ	Jack Assembly (J201, J202: EXT. MIC/J302: REMOTE)	AH
265	QPRBF0070AFZZ	P.W. Board, Main	
266	QPWBF0623AFZZ	P.W. Board, Volume/Switch/Headphone/Jack	
267	QPWBF0624AFZZ	P.W. Board, Power	
268	QSOCZ2469AFZZ	Socket Assembly (SO701: AC/J701: EXT. DC)	AH
269	QTANB9102AFFN	Terminal, Battery (+)	AC
270	QTANB9103AFFN	Terminal, Battery (+)	AC
271	RMICC0057AFZZ	Built-in Microphone	AK
272	LHLDW1067AFZZ	Band, Wire	AA
273	LHLDW1068AFZZ	Band, Wire	AA
274	QLUGP0111CEFW	Lug Terminal	AA
275	QLUGP0150AFZZ	Lug Terminal	AA
276	QT1PF0001CEYW	Tip	AA
278	LANGK0186AFFW	Bracket, Mains Power Switch (GF-9090E)	
279	PZETV0052AFZZ	Shield, Mains Power Switch (GF-9090E)	
280	PCUSG0075AF00	Cushion, Back Cabinet	AB
281	PGUMM0122AF00	Cushion Rubber, Back Cabinet	
282	PFLT-0325AF00	Felt, Switch Knob	
283	LBOSD0050AFFW	Spacer, Mains Power Switch (GF-9090E)	AB
F701	QFS-C102CAGNI	Fuse, 1.0AT	AE
J201, J202	Not Available Part of 264	Jack, EXT. MIC	
J301	QJAKJ0052AFZZ	Jack, HEADPHONE	AH
J302	Not Available Part of 264	Jack, REMOTE	

REF. NO.	PART NO.	DESCRIPTION	CODE
J701	Not Available Part of 268	Jack, EXT. DC (DC 12V)	
ME1	RMTRL0133AFSB	Meter, VU-BATTERY	AT
ME2	RMTRL0132AFSB	Meter, VU-TUNING	AT
PG2	QCNCM102FAFZZ	Plug, 6 Pin	AC
PG501	QCNCM105JAFZZ	Plug, 9 Pin	AD
PL1, PL2	RLMPM0054AFZZ	Lamp, Dial/Meter	AE
SOL501	RPLU-0053AFZZ	Plunger	AM
SO1	QSOCJ2460AFZZ	Socket, FM EXT. ANT	AD
SO2	QCNW-0221AFZZ	Socket, 6 Pin	AH
SO202	QSOCD2554AFZZ	Socket, DIN Type Record/Playback	AF
SO301, SO302	QSOCD2268AFZZ	Socket, EXT.SP	AE
SO501	QCNCW096JAFZZ	Socket, 9 Pin	AC
SO701	Not Available, Part of 268	Socket, Mains Supply (AC)	
SP1, SP2	VSP0016PB204A	Speaker, Woofer	AW
SP3, SP4	VSP00HNT-074A	Speaker, Horn Type Tweeter	AM
SW101 (A∼G)	QSW-P0147AFZZ	Push Switch Assembly A (a∼f): LW B (a∼f): MW C (a∼f): SW D (a∼f): FM E (a, b) : AFC F (a, b) : MUTING G (a ∼ h): FUNCTION	AV
SW201 (A∼P)	QSW-S0197AFZZ	Switch, Record/Playback	AM
SW202 (A∼D)	QSW-B0087AFZZ	Switch, ALC/MANUAL	AG
SW203 (A∼D)	QSW-B0087AFZZ	Switch, Equalizer	AG
SW204 (A, B)	QSW-P0135AFZZ	Switch, EDITOR	AF
SW301 (A, B)	QSW-B0086AFZZ	Switch, LOUDNESS	AF
SW302 (A∼D)	QSW-B0087AFZZ	Switch, METER	AG
SW303 (A∼D)	QSW-B0076AFZZ	Switch, MODE	AG
SW304	QSW-F0107AFZZ	Switch, Dial/Meter Lamp	AC
SW501	QSW-F0106AFZZ	Switch, Forward APSS	AD
SW502	QSW-F0106AFZZ	Switch, Reverse APSS	AD
SW503	QSW-M0055AFZZ	F.F/REW Muting	AG
SW504	QSW-F0044AGZZ	Switch, Motor	AE
SW601	QSW-S0191AFZZ	Switch, RIF	AE
SW602 (A, B)	QSW-B0086AFZZ	Switch, Bias Selector	AF
SW701	QSOCE0551AFZZ	Switch, Mains Voltage Selector (GF-9090H, HB)	AG
	QSW-S0176AFZZ	Switch, AC Power (GF-9090E)	AP
	QACCK0050AFZZ	Cord, Mains Supply (AC) (GF-9090H, HB)	AM
	QACCB0003AG0V	Cord, Mains Supply (AC) (GF-9090E)	AL
	QPLGZ0152AFZZ	Plug, Erase	AB
	RTPEK0057AFZZ	Cassette Tape	AG

DIFFERENCE OF PARTS LIST

○ : Same as GF-9090H

REF. NO.	PART NO.			DESCRIPTION
	GF-9090H	GF-9090HB	GF-9090E	
T701	RTRNP0504AFZZ	○	RTRNP0509AFZZ	Transformer, power
201	GCABA1451AFSA	GCABA1461AFSA	GCABA1452AFSA	Cabinet, Front
205	GFTAC1069AFSA	GFTAC1074AFSA	○	Holder, Cassette
206	GWAKP9003AFSA	GWAKP9003AFSB	○	Cabinet, Operation
208	HDECA0275AFSA	HDECQ0068AFSA	○	Decoration Ring, Woofer
209	HDECA0276AFSA	HDECA0276AFSB	○	Plate, Operation
212	HINDM1153AFSA	HINDM1177AFSA	HINDM1160AFSA	Indication Metal, Model Spec.
213	HINDM1154AFSA	○	HINDM1161AFSA	Indication Metal, Mains Switch
217	HPNC-0107AFSA	HPNC-0110AFSA	○	Punching Metal, Woofer
219	JHNDG1055AFSA	JHNDG1055AFSB	○	Handle
220	JKNBM0249AFSA	JKNBM0249AFSB	○	Knob, Push Switch (BAND, AFC, MUTING)
221	JKNBM0253AFSA	JKNBM0253AFSB	○	Knob, Push Switch (TAPE/RADIO)
223	JKNBP0073AFSA	JKNBP0073AFSB	○	Knob, VOLUME/ BALANCE/TREBLE/BASS/ RECORD
224	JKNBZ0108AFSA	JKNBZ0108AFSB	○	Knob, LIGHT
225	JKNBZ0109AFSA	JKNBZ0109AFSC	○	Knob, MODE/TAPE selector/ ALC/LOUDNESS/METER
226	JKNBZ0127AFSB	JKNBZ0127AFSC	○	Knob, EDIT
262	QANTR0105AFZZ	QANTR0107AFZZ	○	Rod, Antenna
278	- - -	- - -	LANGK0186AFFW	Bracket, Mains Power Switch
279	- - -	- - -	PZETV0052AFZZ	Shield, Mains Power Switch
283	- - -	- - -	LBOSD0050AFFW	Spacer, Mains Power Switch
SW701	QSOCE0551AFZZ	○	QSW-S0176AFZZ	Switch, Mains
	QACCK0050AFZZ	○	QACCB0003AG0V	Cord, Mains Supply (AC)

- - - : Not Used